AUG 14 1957 B 665752

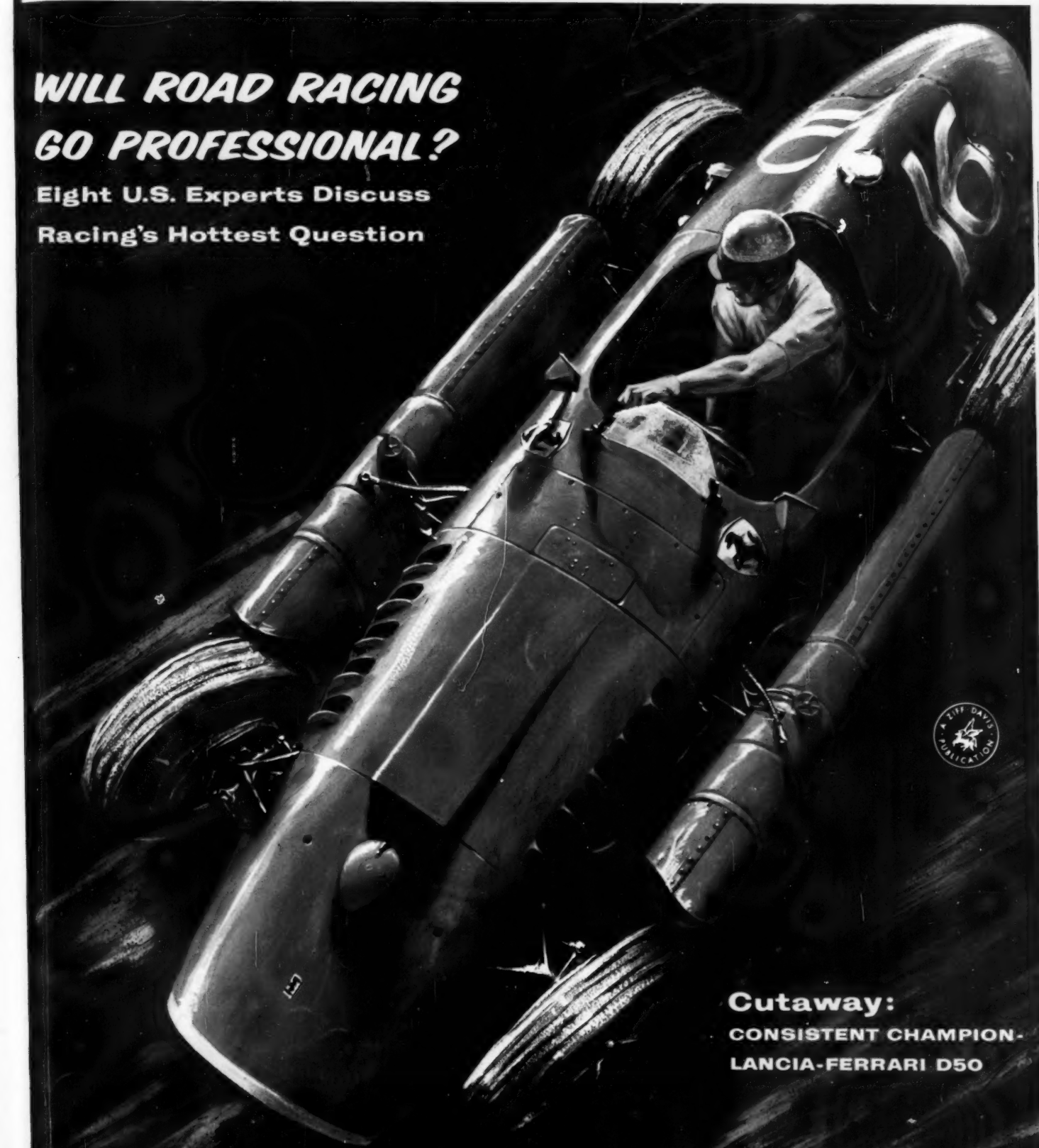
SPORTS CARS ILLUSTRATED

SEPTEMBER 1957 35¢

SEP 5 1957

WILL ROAD RACING GO PROFESSIONAL?

Eight U.S. Experts Discuss Racing's Hottest Question



Cutaway:
CONSISTENT CHAMPION-
LANCIA-FERRARI D50

world's fastest 1500 cc sports car engine . . .

Carrera—first 1500 cc production sports car engine to reach 125 mph—is now available in two modifications. *For competition,* the lightweight 128 hp Gran Turismo Coupe and Speedster are equipped with the new Solex double throat carburetor and specially developed sports muffler. *For street and country driving,* a 110 hp Carrera powers the De Luxe Coupe or Convertible—the classic Porsche sports-touring models. The 1500 Carrera engine has been proved by more than 1,000 victories in international sports car competition over the past two years. Once again, Porsche race-tested engineering pays off in brilliant sports car performance for you.

PORSCHE

Carrera

Other Porsche models from $3215

PORSCHE

DEALERS FROM COAST TO COAST—
for name of nearest dealer write to U. S. A. Distributor:
HOFFMANN-PORSCHE CAR CORPORATION
443 PARK AVENUE · NEW YORK 22, N. Y.

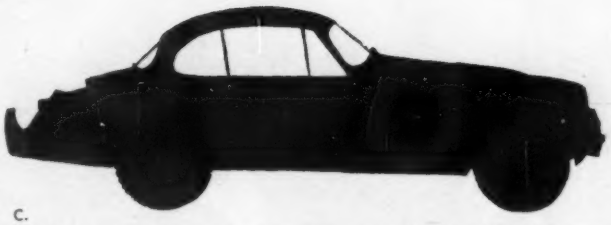
B 665732
AUG 14 1957

Sports Car Quiz

How many of these cars can you name?

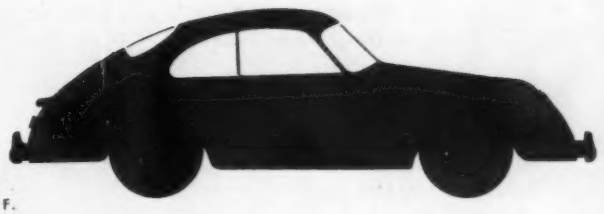

A.


B.


C.


D.


E.


F.

ANSWERS:

A. Austin-Healey D. Saab
B. MGA E. Triumph TR-3
C. Jaguar F. Porsche

Did you know that the makers of all these fine cars recommend

Castrol

The Masterpiece in Oils

Ask your CASTROL distributor or write for the name of distributor nearest you:

CASTROL OILS, Incorporated
75 WEST STREET, NEW YORK 6, N. Y.
...A Division of the Wakefield Group...

SPORTS CARS ILLUSTRATED

september 1957
no. 3 vol. 3

CONTENTS

This month's cover represents a new departure: the use of paintings to show what no photographer could capture on film. This time the Lancia D-50. See pps. 32-37. Painting by Schoenherr.

john christy, *managing editor*

leonard t. griffing, *associate editor*

stephen wilder, *technical editor*

saul d. weiner, *art editor*

griff borgeson, *west coast editor*

jesse l. alexander, *european editor*

dennis may, *london correspondent*

arne g. gittleman, *advertising mgr.*

bill burke, *western adv. rep.*

ZIFF-DAVIS PUBLISHING Co., 366 Madison Ave., New York 17, N. Y. B. G. Davis, President; William Ziff, Administrative Vice President; H. J. Morganroth, Vice President; Michael H. Froelich, Vice President; Michael Michaelson, Vice President and Circulation Director; George Carney, Secretary-Treasurer; Albert Gruen, Art Director.

Member Audit Bureau of Circulations

BRANCH OFFICES: Midwestern Office, 64 E. Lake St., Chicago, Ill., John A. Ronan, Jr., manager; Western Office, Room 412, 215 W. 7th St., Los Angeles 17, Calif., John E. Payne, manager.

SPORTS CARS ILLUSTRATED is published monthly by the Ziff-Davis Publishing Company, William B. Ziff, Chairman of the Board (1946-1953), at 64 E. Lake St., Chicago 1, Ill. Entered as second class matter at Post Office, Chicago, Illinois, under the Act of March 3, 1879.
SUBSCRIPTION RATES: One year, U.S. and Possessions and Canada $4.00; Pan American Union Countries $4.50; all other foreign countries $5.00.
SUBSCRIPTION SERVICE: All correspondence concerning subscriptions should be addressed to Circulation Dept., 64 E. Lake St., Chicago 1, Ill. Please allow at least four weeks for change of address. Include your old address as well as new — enclosing if possible an address label from a recent issue of this magazine.
CONTRIBUTIONS: Contributors are advised to retain a copy of their manuscripts and illustrations. Contributions should be mailed to the New York Editorial Office and must be accompanied by return postage. Contributions will be handled with reasonable care, but this magazine assumes no responsibility for their safety. Any copy accepted is subject to whatever adaptations and revisions are necessary to meet the requirements of this publication. Payment covers all author's, contributor's, and contestant's rights in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

Copyright © 1957 by Ziff-Davis Publishing Company. All rights reserved. Member Audit Bureau of Circulations

Through the steady downpour you're boring down the highway... eating up the miles to the steady flick-flick-flick of the windscreen wipers, thrilling to the round tiger-purr of the engine. As the curves go by, you never leave those tracks, never roll or sway. This is driving.

Suddenly you see him... backing out onto the highway. An immediate downshift to third, but you're going to need brakes... lots of brakes... and there's the difference; these are Girling disc-type brakes*. They laugh at rain and punishment... they respond every time, surely, effectively, constantly. And they're yours as standard equipment on the safe, exciting TR 3. Get the full story from your dealer now.

$2625. plus tax and license at U.S. ports of entry. (Slightly higher West Coast ports.) Wire wheels, hard-top, rear seat, white wall tires and competition kit, etc. optional extra

SPECIFICATIONS:
BRAKES: *Girling disc brakes on front wheels**
TOP SPEED: *110 MPH*
MILEAGE: *up to 35 MPG*
ENGINE: *4 cyl. (OHV) 1991 cc*
OUTPUT: *100 BHP*
ACCELERATION: *0-50 in 8 sec.*
MAINTENANCE:
Parts and service available coast to coast!
Free Brochure and dealer list on request.
Write now—for fun!

**A Triumph-plus . . . as standard equipment.*

STANDARD-TRIUMPH MOTOR COMPANY, INC., Dept. G-9,• 1745 Broadway, (at 56th St.), New York 19, N. Y.

TRIUMPH TR 3

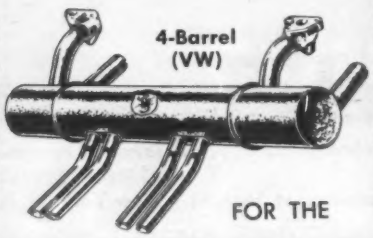
only $2625

ABARTH Sweeps '57 Mille Miglia!

1st, 2nd and 3rd!

ABARTH

FREE-EXHAUST MUFFLERS



FOR THE

**VW* • PORSCHE*
190-SL • BORGWARD
XK-140* • FIAT
DAUPHINE • 4CV**

*=4-Barrel Others: 2-Barrel

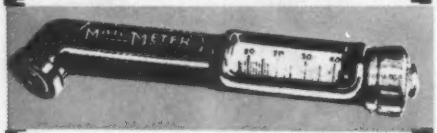
■ 1st, 2nd and 3rd place Mille Miglia 1957 winners used ABARTH mufflers. Now you can enjoy, *on your own car*, the tremendous power increase and absolute reliability that have established ABARTH as the world's finest muffler. On hill-climbing, passing and acceleration you won't recognize your car after you have added the ABARTH muffler! WARNING: Beware of imitations! Look for the ABARTH Scorpion Seal! Installation is so easy you can do it yourself.

For '55 and earlier VW & KG	$32.50
Deluxe, for '56 and later VW & KG	34.50
For all Porsche Models	39.50
For the Borgward Isabella & TS	34.50
For the Mercedes 190-SL	42.50
For the Fiat 600	19.50
For the Jaguar XK-140, Quads per set	79.50
For the Renault Dauphine	23.50
For the Renault 4-CV	19.95

FROM MOTOMETER OF GERMANY

Competition-Type

Tire Testers



■ No part of your car takes a worse beating than the tires. Under-inflation (or over-inflation) ruins them. And correct tire pressure is vital for top acceleration, successful cornering technique and peak performance. Furthermore, most service station gauges are inaccurate. Thus, the *only* way you can be sure is to use a precision tire tester *of your own*. You can buy no finer than the MoTest *Model TT-211*. It is an accurate and rugged instrument, featuring a capillary-type pressure indicator of easy legibility. The MoTest will *pay for itself* many times over with long tire life.

Capillary-type, as shown, 9-43 lbs.* $2.95
Clock-type, 2" dial, 10-50 lbs.* $1.95
*Including Genuine Leather Pouch

Write for Booklet • Dealer Inquiries Invited

FISHER PRODUCTS

21-25 44th DRIVE • L. I. CITY 1, N. Y.

very sincerely yours:

JUST PRIOR to the so-called "Race of Two Worlds" at Monza last June (which turned out to be somewhat of a one-world show) a gentleman by the name of Stirling Moss, a name to which has gravitated some fame as a driver of quick machinery, made a short speech on television. In the interview, Mr. Moss made his apologies to the people for not participating. Just before he spoke his piece, there was a film clip showing cars blasting over and off the rim of a steeply banked track. Then came Mr. Moss with a terse explanation to the effect that tracks like Monza were "dangerous." He went on to say that at the speeds anticipated there could not possibly be any passing—the whole affair would turn into a three-part parade signifying nothing.

A lot of other drivers apparently felt the same way. They formed a loose organization known as Union des Pilotes Professionels Internationaux (UPPI) and said collectively "Uh-uh" to the Monza 500. One who didn't was Behra, who talked the brothers Orsi into entering a pair of Maseratis and another was Peter Collins who later said he'd go wherever Enzo Ferrari asked him to go. Enzo didn't like the size of the purse and stayed out—very likely to Collins' relief since Peter has gone on record as saying that he'd tried it once and didn't like it. The Masers (a 4.2 V8 sports car and the new V12 GP engine in a 250 chassis) couldn't handle the big Firestone tires and were withdrawn, much to Behra's disgust. The Ecurie Ecosse Jaguars entered, stayed and finished—and to them goes all credit, and a big "well done."

As is now known, the Americans went like gangbusters, passing wherever they wished, showing the Europeans a turn of speed and handling that still has the continentals gasping. There were no tire troubles and no accidents, period. So much for Mr. Moss et al and their stated excuses. Had the UPPI stated bluntly that they didn't have the cars or the rubber with which to compete on reasonably equal terms no one could have objected to the abstention. Carping about safety and the "impossibility" of passing is another matter, especially when coming from those who are supposed to be top-drawer professionals. The taste was strongly redolent of chicken.

* * *

Next month will be something in the nature of a competition issue, several big events piling up as they did. Covered will be the Nüburgring, Le Mans and, of course, Jesse Alexander's detailed report on Monza where some people in Jaguars had to try to uphold the racing honor of all the lands across the pond as mentioned above. Also coming up is the second part of the Snell Foundation research on crash helmets, this time buttressing Dr. George Snively's massive compression tests with electronically measured "G" impact shocks. You can't afford to miss this one if you wear a protective hat of any kind for any purpose.

— john christy

OH YEA!

"SO THERE I WAS . . . COMIN' AROUND THE LAST TURN . . . HEADING INTO THE STRETCH WHEN I LOOKS BEHIND AND SEES 'EM CATCHING UP. IT TOOK SOME FANCY DRIVING TO BEAT 'EM."

"JUST AS I THOUGHT. THE THROTTLE WAS STUCK."

letters

safety

It seems to me the Ed. took a rather narrow minded viewpoint on the issue of safety. It isn't the idea of safety itself. Safety I'm all for. It doesn't bother someone like Edgar or Cunningham to put roll bars on their cars, but is the genuine amateur who drives his car everyday, going to put a roll bar in the family pride and joy for the dubious privilege of being beaten by well subsidized drivers from the above mentioned stables? To top it all off you may be black-flagged because some club Pharoah doesn't like your cut-off points even though you may have been racing for say 30 years or so. While we're on the subject, will someone define "erratic driving" for me?

Concerning safety, I thought Mr. Christy would use a bit more tact in taking a stand. He mentioned the D Jags at Elkhart, well I don't know of any real amateurs that own D's. Granted big names bring crowds but it sounds like professionalism and this is amateur.

Concerning safety belts, I like and use them but I'd like to see Ed. sell Frankenburg on belts after his flip at the Avus Races. I'll grant you bars may save lives but how many will trees take? Why not do something about them, or are some of the Pharaoh's tree lovers? On page 62 you said the BRM 4 banger had a 4 bearing crankshaft???? Mr. Christy also forgot to say that the club concerned handled the issue on the wheel-shedding tendencies of some cars with all the dexterity of a bull elephant in the rutting season. I still think you have a fine magazine.

Charles Nelson
Torrance, Calif.

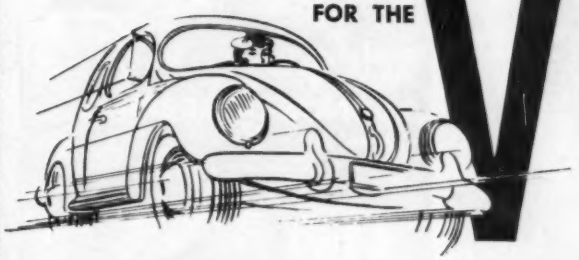
We'll make no comment anent "club Pharaohs" since there are poseurs in every outfit. As far as Von Frankenburg's crack-up at Avus goes, it is unlikely that such an accident will occur again in a number of years. Only a freak accident would toss a car over that particular piece of banking. The D-type was used as an example merely because it was such a pointed instance. A goodly number of D's are owned by Simon-pure amateurs. We might say here and now that amateurism is not necessarily dependent on the type or cost of car owned. As for the last question – the BRM does indeed have four mains; there's an extra main at the point of major crank stress, straddling the area of valve gear drive at the rear of the engine. – Ed.

problems

May I avail myself of your column to reach some of the people who wrote for the VW Service manuals and may not have

(Continued on page 8)

WORLD'S FINEST ACCESSORIES FOR THE VW



MotoMeter

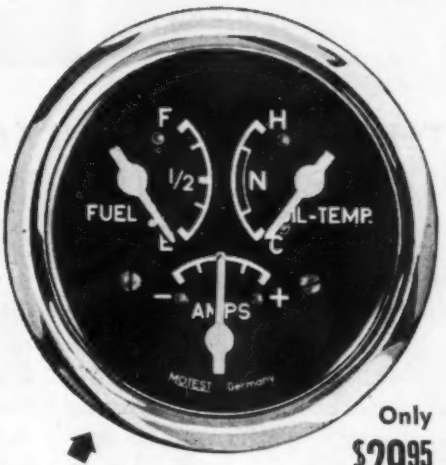
3-in-1 Dash Instruments

(For 1956 VW and Later)

- GAS LEVEL GAUGE
- OIL TEMP. GAUGE
- AMMETER

ALL IN ONE 2⅜" CHROME CASE

■ The world's most compact, all-electric instrument made especially for the VW and Karmann-Ghia. Accurate and reliable operation. *Easy installation.* Fits right into dashboard. Complete step-by-step installation instructions. 2⅜" chrome case.



ACTUAL SIZE

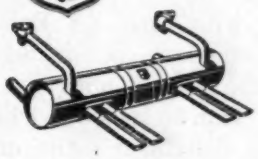
Only **$29.95**

THESE SEPARATE, FULL-SIZE INSTRUMENTS ALSO AVAILABLE

Fuel Level Gauge for 1956 VW and Later, 40 mm.	$14.95
Precision Ammeter, 60 mm.	4.95
Oil Temperature Gauge, 52 mm.	10.75
Chromed Under-Dash Mounting Bracket	1.75

ABARTH Sweeps '57 Mille Miglia (1st, 2nd & 3rd!)

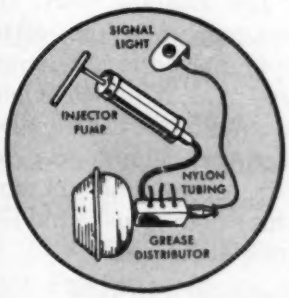
4-Barrel ABARTH Muffler



■ 1st, 2nd and 3rd place Mille Miglia 1957 winners used ABARTH mufflers. Now you can enjoy, *on your own VW*, the tremendous power increase and absolute reliability that have established ABARTH as the world's finest muffler. On hill-climbing, passing and acceleration you won't recognize your car after you have added the four-barrel ABARTH muffler! WARNING: Beware of imitations! Look for the ABARTH Scorpion Seal! Installation of the ABARTH is so easy you can do it yourself.

Model A-100, For '55 VW and Earlier. $32.50

Deluxe Muffler for '56 and later, Model A-200, $34.50



AUTOMATIC LUBRICATION

MULTI-LUBER

■ No more searching for small lifts to fit your VW! No more careless attendants who force dirt into the grease fittings, and miss the hard-to-get-at fittings. You can now grease your own car in 4 seconds – for only ¼¢ – *while you are driving* (bearings in motion lubricate best)! Grease is forced into every fitting at 2000 pounds pressure. Pilot Light shows when lubrication is completed. Multi-Luber gives you that "just lubricated" ride *every day*, with absolute dependability (there is only 1 moving part). *Easy installation.* **$29.95**

Automotive Indoor-Outdoor

AIR THERMOMETER

■ Now available in America! The world's only Indoor-Outdoor Automatic Thermometer. Indicates inside and outside air temperatures. Warning Light automatically signals ice conditions on the road. A terrific safety device! The instrument is illuminated, and can be installed in ANY car. 2⅜" chrome dial.

TH-311-6V (For 6-Volt Systems)	$9.95
TH-311-12V (For 12-Volt Systems)	$9.95
Chromed Under-Dash Mounting Bracket	$1.75

For Any Car!

WRITE FOR BOOKLET • DEALER INQUIRIES INVITED

FISHER PRODUCTS · 21-25 44th DRIVE · L. I. CITY 1, N. Y.

Sounds of Sebring 1957

RLP 5008/9 $11.90

THE MOST SPECTACULAR SPORTS CAR RECORDING EVER PRODUCED

We have produced some pretty fair recordings on sports car racing. We know we have because you have told us so over and over again. However, in all immodesty we must announce that the recording of this year's Sebring was so successful that we are compelled to issue a two record set so that you will not miss any of the great interviews and sounds which we captured on our specially prepared equipment. We went down to the wastelands of central Florida, all twelve of us, with over two tons of recording equipment. The pits were wired so that whenever anything happened anywhere in the pit area we needed only to have one of our people plug a microphone into the lines and instantly what was happening at that spot was recorded back at our mobile unit. A custom-designed and constructed four-foot parabolic microphone shaped like a vertical flying saucer was used to record the sounds of the cars roaring down the stretches, shifting and braking into the corners. The sounds we captured with this device are unbelievable—by far the finest we have ever taped. Portable high fidelity recorders, especially made in Switzerland, enabled us to get interviews before and during the race with almost every important figure at the track: Fangio, Cunningham, Hawthorn, Collins, Ginther, Hill, Shelby, Moss, Portago, Salvadori, Kimberly, O'Shea, Taruffi, Chinetti, Von Trips, Von Hanstein, Colin Chapman, Wyllie, Dave Ash, Duntov, Gregory, Brero, and many others. Our pit stops are especially exciting, featuring a series of stops by Von Trips and Hill, during which they try to diagnose the trouble with their 3.8 Ferrari. A short scene in the pits immediately before the race when we caught the Ferrari team en masse twirling yo-yos is a delightful satire on ourselves. The LeMans start, crowd reactions, roaring engines—all make for the finest sports car recording ever presented. A full-color photographic cover of the car Fangio and Behra drove to victory plus pictures galore in this double album set make this a marvelous sound report of Sebring 1957.

Clip the coupon below and send today for your copy.

RIVERSIDE RECORDS DEPT. S — 553 W. 51st ST., NEW YORK 19, N. Y.

Please rush..... .sets of Sounds of Sebring 1957

at $11.90 per set. I enclose $.....

Name _____

Address _____

letters

(Continued from page 7)

received their copies as yet.

I have written acknowledgment to everyone but, owing to the terrific demand I have cleaned out the local supplies and am now waiting for a further lot from the publishers.

I might add that the supply of brown paper, string and spit for the stamps is also low. However, I am sure that I'll make it providing the demand slows down soon.

The manuals worked out a bit cheaper than the $6 and I have sent them by a faster rate to use up the 75 cents balance owing.

Finally, I would like to say that the SCI is improving with each issue. I enjoyed especially the article "How Temporary was my Triumph."

Yours sincerely,
A. J. Buckman
49 Waiatarua Rd.
Remuera, Auckland
New Zealand

in appeal

Having already tried, unsuccessfully, to obtain the September and November 1955 issues of SPORTS CARS ILLUSTRATED to complete my personal collection may I appeal to your readers for help.

These are the only two issues that I have missed and I shall be pleased to pay for or exchange copies of European motoring magazines for copies that are in good condition.

In passing may I take this opportunity in congratulating SPORTS CARS ILLUSTRATED as being one of the finest publications of its class in the World today and, believe me, I regularly see most of all the others.

John Lello
Motor Books
41/42, Parliament Street
London, S.W.1, England

possibilities

Your road test of the Alfa Veloce Coupe (February issue) created quite an interest in my heart for this car. Just where can I get more information; such as dealer or distributor, import price, equipment and etc.? Would you know, and if so would you pass the information along to me?

I have only one complaint (or perhaps two) of your magazine. It isn't published often enough (should be at least two a month) and it isn't long enough. Just the same, keep up the good work and high quality produced so far.

Richard R. Pass
6318 City Line Ave.
Philadelphia 31, Penn.

Suggest you contact Hoffman Motors, 487 Park Avenue, New York City. — Ed.

(Continued on page 12)

The Marquis de Portago

(1929-1957)

A MEMORIAL TRIBUTE

In his own words and in the words of some of his greatest competitors – a portrait in sound of racing's most colorful figure.

RLP 5007 **$5.95**

RLP 5005 **$5.95**

RLP 5004 **$5.95**

RLP 5006 **$5.95**

Here for the first time you can bring three of the finest drivers into your own home via these LP recordings. Listen to them discuss their racing careers, experiences, techniques and opinions. Hear **Phil Hill (RLP 5005)** as he tells of the problems of hurling a Ferrari through a 130 mph corner, his eye-witness account of the 1955 LeMans (accident and race), his early experiences, etc. **Stirling Moss (RLP 5004)** takes you racing with Mercedes Benz, discusses driving techniques, rates the world's drivers, etc. **Carroll Shelby (RLP 5006)** top U.S. driver explores the American racing scene, takes you behind scenes in Europe, etc. After you hear these three absorbing recordings you will have a keener insight into the qualities which make for championship driving, which inspire these men to approach so closely to death time and again. These and dozens of other subjects are discussed at length by Moss, Hill and Shelby. Get your copies today. Just $5.95 for each LP.

RLP 5003 **$5.95**

In the pits at Nassau, pit activity, conversations, emergencies, high emotion. The story of a typical race; drivers meeting, LeMans start Portago, Moss, Shelby, Hill etc. Fabulous sounds as usual.

A solid hour of just sounds of racing cars in spectacular HI-FI.

RLP 5002 **$5.95**

The 1956 race . . . over an hour of sounds, interviews, and an hourly report of the race.

RLP 5001 **$5.95**

RIVERSIDE RECORDS
553 WEST 51 ST.
NEW YORK 19, N. Y.

Please rush the records checked. ☐ 5001 ☐ 5002 ☐ 5003 ☐ 5004 ☐ 5005 ☐ 5006 ☐ 5007 at $5.95 each. I enclose $_____. Send the records postpaid.

Name_____

Address_____

MARION'S MEANDERINGS

By Marion Weber

Hi, there. And a special word to you competition drivers: **We have it!** By "it", we mean anything you need in the way of personal equipment to make your weekend racing more comfortable and enjoyable.

When you show up in the winner's circle you'll want to look good, right? Well, for the smartest-appearing and best-fitting driving suit you can't beat **SPORTS-ALLS** Modeled here by Jack Bates, a consistent winner with his 300SL, you can discern the sharp tailoring of **SPORTSALLS.** What you can't see but the reason most drivers buy for is the lightweight, cool comfort. No bind in the legs or armpits. Small, Med. Large. Red, White, Blue, Black, Oxford gray..Only **$18.95** pr. Fireproofing kit .....Only **$ 1.50**

CONTOURED GOGGLES designed by a famous Grand Prix driver are small, light and stay firmly in place at high speed. Molded, ventilated contoured rubber replaces sponge and assures long life and comfort. Nose piece is adjustable.
Only $5.95
Extra lenses Only $1.95

CUSTOM GOGGLES . . . same as above but with detachable section for inserting prescription lens ground by your optician.....Only **$6.95**

GRAND PRIX GLOVES . . . as worn and enjoyed by top drivers/enthusiasts. Natural tan cape, double palm, vented back. Finest quality. Sizes (men) 7½-10 (gals) 6½-7½. Only **$7.95** pr.

LES LESTON GLOVES . . . extra light capeskin palms, crocheted back, gathered wrist . . . Sizes 7-10 .....Only **$6.50**

REPLACEMENT KNOBS for shift lever. In two sizes to fit the hand . . . and make handling the change lever easier and surer. MG, Healey, TR, Mercedes, VW, etc. Specify large or small and make of car .....Only **$2.25**

SMART DRIVERS keep their machines covered with **MG MITTENS** while in the pits and on the trailer. If your charger isn't here, write for prices:

MG Mitten Healey Hugger	$17.95	Lightweight Canvas
Triumph Tunic Guilietta Jumper (Spyder)	$24.50	Duralin (Not plastic) water repellent
Guilietta Jumper (Coupe) Jaguar Jacket Porsche Parka	$22.95	Canvas
V.W. Vest Mercedes Muff (190-300SL)	$29.50	Duralin
Corvette Cap	$27.95	Canvas
Thunderbird Tepee	$32.50	Duralin

BRAND NEW CATALOG IS NOW AVAILABLE FREE . . . ask for it

MG MITTEN Box 157, Dept. S9
3044 N San Gabriel Blvd.
SOUTH SAN GABRIEL, California
PHONE CUmberland 3-1410

TECHNOTES

HANDLING HINTS

The comments on Maurice Conte's letter (May '57) interested me, and I would be pleased if you would enlarge on the theme of "slightly less rear tread than front for good high speed handling, and just the other way for low responsiveness". My own thoughts about this are that it would be preferable to have equal front and rear tracks, for the reason that a neutral-steering car is preferable to an over- or under-steering car, with the second choice being for mild understeer. If you consider the extreme condition of lateral loading on the car (due to cornering or sidewinds) the two outer tyres will be carrying almost all the load, and the tendency will be for the rear tyre to follow in the track of the front one like a motor cycle. When the front track is greater than the rear, the rear tyre will be at an angle to the line joining the two contact patches, and the effect will be to steer the rear of the car "inwards"—i.e. understeer. In order to obtain neutral steering it will then be necessary to "misalign" something else to the same extent to compensate for this understeer effect, and it seems simpler to provide equal tracks front and rear, provided that you want neutral steering.

Regarding Mr. G. Harrop's letter – if he feels that his MG Magnette leans too much on corners, then surely the cure is to provide stiffer anti-roll springs rather than increasing the damper resistances although obviously he drives hard and so stiffer dampers would probable be acceptable as well. In order to retain the existing handling characteristics it would be necessary to increase the front and rear roll stiffness by the same proportion, and the increase should be at least 25% to be perceptible.

I haven't driven a Magnette but if its seating arrangements are anything like the T.D. then I would suggest that an improvement in the sideways location of the driver would make the car more fun to drive.

D. A. White
Durban North, South Africa

I do not agree with you that the tendency will be for the rear tire to follow in the path of the front one—why should it? Misalignment of the outside front and rear wheels in the sense you use would seem to be significant only with regard to the thrust of the rear wheel and its moment arm about the C.G.; the larger the rear track, the more the thrust assists the car to turn and therefore the less side load required at the front wheel to achieve the same rotational acceleration. It would take rather large changes in track to achieve noticeable variations in the front/rear slip angle ratio even at full throttle. (Front/rear slip angle ratio equal to 1.0 means neutral steer, greater than one is understeer, less than one is oversteer). Much more noticeable would be the change in front/rear weight transfer relationship with changes in track. The more the roll couple is carried by the rear wheels (wider rear track), the less will be the front/rear slip angle ratio. And oversteering cars, while not necessarily stable on the straight, are very nimble around tight bends.

Neutral steering is not the ultimate. Understeer corresponds to positive stability but as cornering accelerations (side load/weight) become very great, it is desireable to have a pleasantly smooth *transition to final oversteer which can be controlled with the throttle, assuming ample power is available. With final understeer the front wheels "stall" out and the driver has little or no control over them until the cornering acceleration is reduced, either by lowering velocity or straightening the front wheels (but by then you may be through the fence). If the car in question does* not *have enough power to steer on the throttle, then it should have final understeer so you at least do not suffer the ignominy of going through the hedge backwards.*

About the MG Magnette or any other car which rolls too much, I agree with you completely. You should realize though, that anti-roll bars reduce the independency of your front suspension, giving a less comfortable ride over bumpy surfaces.

CLASS H REQUIREMENTS

I'm interested in building a Class H sports car. First, since this is a special can I go the limit in reworking the engine as long as I stay under 750 cc? Second, could I use a 650 cc Triumph motorcycle engine with chain drive and still race with the Crosley specials? Of course I'd have the required two seats and full lighting and spare tire. I plan to use the above mentioned engine and gearbox, in a very light tubular frame with Crosley running gear. Body would be either aluminum or Fiberglas. Any comments?

Wayne Houston
Dallas, Texas

As long as you're running in Class H Modified, as you are, you can use anything from a Guzzi V-8 to a pair of washing machine motors as long as you stay under 750 cc and run it on pump fuel. Your general plans seem sound, but I recommend strongly that you try to find running gear from a Fiat 500 Topolino. Crosley suspension can be modified to the point where it's satisfactory (see Eyerly Crosley, Feb. 1957 SCI), but the Fiat front end is perfect for Class G and smaller cars. Try to keep the car as light, compact and

simple as possible. Keep the weight of wheels and axles down also. You can pick a good Fiberglas body from commercially-available shells. Then for info on going Class H specials, you can't beat back issues of SCI!

CALLING ALL CROSLEYS

Since we've given a due share of attention to the fast, cheap and fun-to-build Class H and Crosley specials, a considerable deluge of mail has descended requesting addresses of suppliers of parts and speed equipment for these machines. As a ready reference for all you gents we hereby print some good names that can be handy no matter what you're building or driving.

For genuine Crosley parts, and the 1946-52 Crosley Shop Manual at five bucks each (also main office for the Crosley Owners' Club):

Service Motors
581 Hempstead Turnpike
Elmont, L.I., N.Y.

For manifolds, cover plates, other speed equipment for the Crosley four:

Nick Braje
422 West 83rd Street
Los Angeles 3, Calif.

For special camshafts:

Ed Iskenderian
6338 West Slauson Avenue
Culver City, Calif.

For Italian-built Crosley speed equipment:

Nardi and Co.
Via Paolo Braccini, 86
Turin, Italy

For Fren-Do brake linings, Pirelli tires and other imported accessories:

Columbia Motor Corp.
245 West 56th Street
New York, N.Y.

For Norden carburetors, injectors and other fuel feed equipment:

Moon Automotive Equipment
Box 432
Santa Fe Springs, Calif.

For Michelin X tires:

Michelin Tire Corp.
150 Green Street
Brooklyn, N.Y.

For information on Al-Fin aluminum bonding process:

Wellworthy, Ltd.
Stanford Road
Lymington, Hampshire, England

For Fiberglas bodies and anything else you may think of be sure to check among our advertisers *first*.

Now! Send no cash! SCI readers ordering on coupon below have privilege of charging books with Robert Bentley, Inc., 8 Ellery St., Cambridge 38, Mass.
Every order shipped or acknowledged the day it is received!

128 full page illustrations

with every purchase of $12.00 or over! FREE

THE BIG RACE regular price **$4.00**

BEST ACTION ILLUSTRATIONS EVER!

The Road & Track reviewer says: "Printed in Germany and described as 'the story of motor racing' this 216-page book written by Ernst Rosemann includes 88 pages of well-written text . . . ***much better than found in any other account we have read.*** The 128 pages of illustrations by Carlo Demand are alone worth the price of the book—*they are absolutely sensational.* Arranged chronologically, and carefully indexed as to subject, these illustrations portray motor racing's progress . . . *Every prominent or outstanding car is shown in its respective era . . .*" Gives the story behind every big race from the first, and *covers the careers of some of the most exciting names in racing history.* The beautiful action illustrations depict some of the biggest moments in the biggest races, *described in many cases by the actual drivers themselves.* Mercedes-Benz '52 to '55 racing covered fully. 10.8" x 7.3".
36 **The Big Race** (*on book purchases less than $12.00*) $4.00

FREE *with every purchase of* **$6.00** *or over*
High-Performance Cars '56-'57
Regular Price $2.00

Partial Table of Contents: My Year with Ferrari, by Peter Collins; Covering the Mille Miglia The Hard Way; The Performance of 1,500 c.c. Sports Cars in 1956 Racing; Production Car Racing; Le Mans—The Winning Jaguar; Vanwall and B.R.M.; Cars of 1957; Gas Turbine Cars; Road Test Reflections, by John Bolster; The Grand Prix Gordini; The B.R.M.; 750 S Ferrari; A. C. Ace Bristol; Cooper and Lotus, by Theo Page; The D-Type Jaguar; Page in the Paddock—Silverstone; Jaguar XK-140; Austin-Healey "Six"; Bentley "S"; Modified Volkswagen; Mercedes-Benz 190 SL; A TR2 Plus; Lancia Aurelia; Denzel; Aston Martin DB3S; Austin 105; A Pair of Porsches; "Alpine" and "Monte."
12 **High Performance Cars '56-'57** (*on purchase less than $6.00*) ... $2.00

Third FREE Offer! Order $18.00 or more worth of books *on coupon below* and get both **The Big Race** and **High Performance Cars '56-'57** *FREE!* If you already have one of these ask for our *Surprise Substitute.* **Guaranteed to please.**

155 **The Sports Car: Its Design and Performance By Colin Campbell.** The Technical Correspondence Editor, **Road & Track,** in answer to a request for a good reference book on suspension and chassis design says: ". . . by far the best book is *The Sports Car: Its Design and Performance,* by Colin Campbell . . ." *Our fastest selling sports car book.* The first thorough and systematic treatment of the sports car from a technical point of view, yet in layman's language. Partial Table of Contents . . . Chapters: Development of the Sports Car; Engine: Cylinder Head Design; Engine: Induction and Exhaust; Engine: Miscellaneous Components; Engine: The Trend of Design; Road-Holding; Suspension; Chassis & Body; Transmission; Brakes; Tuning; Performance: Future Development; Glossary of Technical Terms; Index $6.50
85 **Tuning and Maintenance of MGA** by Philip Smith. Devoted entirely to MGA and Magnette $5.00
86 **Modern Racing Management** by Wyer $4.50
87 **World's Automobiles 1880-1955.** Contains an international alphabetical list of names, places and dates of manufacture of almost 4,000 automobiles produced within the past 75 years. Essential reference book $4.00
41 **Maintaining The Breed** by John Thornley. Up-to-date expanded edition of the great saga of MG racing cars. 178 pages $5.00
20 **Pursuit of Victory** by Karl Kling $4.00
37 **Juan Manual Fangio, World Champion.** $5.00
77 **Racing Sports Cars.** Brand new by authors of *Drivers in Action,* packed with thrills $2.95
84 **Volkswagen Owner's Handbook** $2.00
18 **Three-Pointed Star: The Story of Mercedes-Benz** by David Scott-Moncrieff with St. John Nixon and Clarence Paget. Far-and-away *the best book on the Mercedes.* 5½" x 8½", 478 pages, 78 photos $7.50
56 **"MOTOR" Yearbook 1957** $4.50
83 **Press on Regardless.** "One of the most entertainingly funny books about sports car people you've ever read." *Road & Track* $2.95
78 **The Racing Car: Development and Design.** From 1895 to 1956. After Pomeroy's *Grand Prix Car,* the best summary $6.50
40 **Blackwell Calculator, Mk 1** $4.50
42 **Blackwell Calculator, Mk 2** $7.50
43 **Blackwell Calculator, Mk 4** $12.50
47 **Stevens Rally Indicator** $7.50
17 **Sports Car Rallies, Trials and Gymkhanas.** First book on subject. **Big 8½" x 11" size** $5.00
5 **Tuning for Speed and Economy** $4.00
6 **Drivers in Action** $3.50
99 **MG Workshop Manual** $8.50
7 **Sports and Classic Cars** $12.50
141 **Grand Prix Car,** Vol. 1 by Pomeroy $16.50
142 **Grand Prix Car,** Vol. 2 by Pomeroy $20.00
143 **Grand Prix Car,** 2 volume set $32.50

57 **Complete Jaguar Factory Service Manual for MK VII and XK 120 Models.** After 6 yrs. of looking, we've found a few! Order Today. There probably won't be another opportunity. A must for XK 120 or Mk VII owners $12.50
58 **Motor Racing** edited by Sammy Davis. Brand New! Not only the thrilling story of a great sport, but a mechanical guide to the intricacies of motor engineering in detail, from drawing board to the complete car, illustrated throughout with accurate drawings and many photographs. Some chapter headings: Grand Prix Racing (Moss); Sports Car Design (Heynes of Jaguar); Preparation (Wyer of Aston-Martin); Racing Car Design (Uhlenhaut of Mercedes); Disc Brakes; Engine Design; Policy of Design (Nallinger of Mercedes); Carburetor & Supercharging; Spark Plugs; Racing Tires; Brakes & Brake Linings; Braking Problems; Hill Climbing; Motor Racing Promotion; 500cc Racing (John Cooper) etc. ... $8.50

163 **Automobile Year 1957** (Annual Automobile Review from Switzerland) *Better than ever!* The most luxurious picture-and-word review of motoring, racing and design. Hard covers 9½" x 12½". Supplies limited. Buy this from Bentley and get a free copy of **High Performance Cars 1957** or count toward your *FREE* copy of **The Big Race.** $9.95

115 **Car Driving As An Art** by Davis $3.50
100 **Tuning and Maintenance of MG's** $4.50
38 **From Veteran to Vintage** by Karslake and Pomeroy. Highly praised Aug. R & T $8.50
151 **Modern Sports Car** by McCahill $3.95
138 **Design and Tuning of Competition Engines** by Philip Smith $7.50
76 **Automobile Chassis Design** $8.50
15 **Caracciola** (autobiography) $4.00
13 **Targa Florio** $4.00
28 **The High Speed Internal Combustion Engine** by Ricardo. *The classic work* $12.00
161 **The Volkswagen Story, Beyond Expectation** $4.00
175 **Stirling Moss' Book of Motor Sport** $3.50
45 **Automobile Engineer's Reference Book.** 57 British automobile specialists contribute half-a-million words in 1664 pages, 1010 diagrams, 255 photos in 30 main sections *covering every aspect of the design and production of motor cars.* **Buy it from us** and *get a free copy of both* **The Big Race** and **High Performance Cars 1957** $20.00

48 **Austin Healey 100 Factory Service Manual.** Thru '56. A *must* for the Austin-Healey owner $8.50

—CLIP THIS COUPON—CIRCLE THE BOOKS YOU WISH—

To ROBERT BENTLEY, INC., 8 Ellery Street, Cambridge 38, Mass.

I enclose $..... in check.... or money order..... **Please supply books circled at left. Send to:**
☐ **Bill me for books and postage.**
5 6 7 12 13 15 17 18 20 28 36 37 38 40 41 42 43 45 47 48 56 57 58 76 77 78 83 84 85 86 87 99 100 115 138 141 142 143 151 155 161 163 175
(.....Check if you wish our free catalog.)
.....36 or .....12 Free under special offer. Please check.

Name.....
Street.....
City.....**Zone**.....**State**.....

SCI 97

World-famous racing driver Stirling Moss and his Sunbeam Rapier

Champion race drivers choose the

SUNBEAM RAPIER

Sports car enthusiasts with family car requirements are wise to follow the lead of the world's top sporting drivers who choose Sunbeam Rapiers for their personal transportation. For here is striking proof that only the stunning, spirited Sunbeam, among all family sedans, comes so close to matching the exciting performance that attracts men like this to racing cars.

There is much to admire in a Sunbeam: its surging acceleration from 0 to 60 m.p.h. in under 20 seconds; its perfect spacing of six gear ratios; its hair-trigger controls that respond to every instant command; its incredibly durable ohv power plant with 8 to 1 compression ratio; its sturdier, safer unitary chassis; the relaxed comfort it offers for hundreds of miles at a stretch. Parts and service everywhere. If you drive for fun, road-test a Subeam Rapier, at your nearest Hillman/Sunbeam dealer's.

A ROOTES GROUP PRODUCT

SUNBEAM

Rootes Motors, Inc., 505 Park Avenue, N. Y. C., N. Y. • 9830 W. Pico Blvd., L. A., Calif.
In Canada: Rootes Motors (Canada) Ltd., Toronto, Montreal, Vancouver

letters

(Continued from page 8)

controversial issue

It seems rather prejudicial and unfair to those who are under twenty-one years of age and serious enthusiasts, that the Sports Car Club of America has put a flat ban on their participation in any SCCA-approved events. Considering their perfect safety record in three years of intercollegiate competition of all types (the individual clubs all run numerous rallies and gymkhanas throughout the school year) except races and the serious, considerate, careful approach evidenced in all the events, it seems as though the SCCA might give them an opportunity to prove themselves in rallies and hillclimbs. None of them ask any special favors, and invite the most careful scrutiny of both themselves and their machines before competing and during the competition. They ask only the opportunity to prove their capabilities. Perhaps an "America Class" for those under 21 who qualify, restricting them to, perhaps, modified cars under 750 cc. and stock MG's, might be acceptable to the SCCA — it would be to them.

Frank Hamm
77 Columbia Heights
Brooklyn 1, New York

Mr. John Christy
Managing Editor of
"Sports Cars Illustrated"
366 Madison Avenue
New York 17, N. Y. U.S.A.

With great pleasure I have received your May issue with the excellent 300 SLR engine description written by your technical editor. Please allow me to say that this was one of the most intelligent articles I ever saw and I want to take this opportunity to congratulate you on this outstanding personality.

Will you please be kind enough to transmit to Mr. Ludvigsen our sincere appreciation.

With best regards,
Yours sincerely,
Artur J. Keser
Director of Public Relations
Daimler-Benz A. G.
Stuttgart

roll bar row

I feel that Mr. Keech has misinterpreted the reasons behind the SCCA's ruling concerning roll bars. If this rule were intended to protect just the drivers themselves I would agree wholeheartedly with Mr. Keech that roll bars ought to be left up to the discretion of the individual. Such is not in the case, however, as there are, unfortunately, many people who are opposed to auto racing and find any accident

a most effective bit of evidence upon which to base their opposition.

Any serious accident on a race course naturally receives a lot of publicity and, therefore, provides these individuals with the kind of ammunition they need to launch an attack against the sport. For this reason a man not only runs the risk of injuring himself but also of doing almost irreparable damage to the sport of auto racing if he undertakes it without observing the necessary precautions. If Mr. Keech does not consider a roll bar a necessary precaution perhaps he would change his mind if he had seen Bob Goldich get killed at Sebring this year.

If certain individuals cannot take upon themselves a sense of mature responsibility toward the organization, it is then up to that organization to enact legislation to prevent these people from compromising its name. This is exactly what the SCCA did and I think that they should be commended rather than criticized for doing so.

Sincerely yours,
Peter J. Harrison

AMEN! — ED

200 a week

In "Sixty Fast Years" (SCI, August issue) I inadvertently said production of Austin Healey's 100-6 was coming up to 200 cars per month. This should have read 200 cars per *week*. Apologies.

Dennis May
London, England

supercharging

I am very much interested in the Latham axial-flow blower described by Roger Huntington in the June issue. I would appreciate it if you could send me an address where I could get additional information about it regarding prices, literature, etc.

Yours truly,
Lynn Zackowitz
c/o Wishon Dam
Fresno, Calif.

Suggest you contact Latham Manufacturing Co., P.O. Box 165, West Palm Beach, Florida. — Ed.

M 196

You are to be congratulated on the May issue of Sports Cars — for the sensational mechanical news scoop under "M 196 Mercedes Hottest Engine". This article should have been pre-advertised at time of publication in prominent newspapers, due to the practice of news circulation distributors who recall May issues when June issues are distributed. In this instance the distributor has withdrawn May copies from Chicago market — none are now available since May 18th.

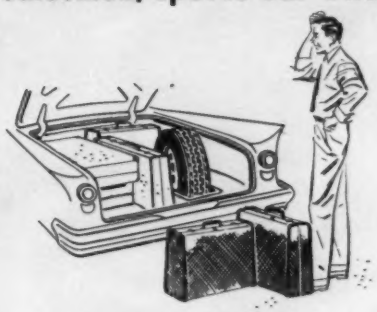
The article should be published again perhaps with larger or whole page plans.

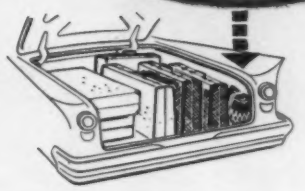
Sincerely,
Robert Miller
Chicago 40, Illinois

You can still get the May issue from the Ziff-Davis Chicago Office at the regular news-stand price. Ed.

Gates revolutionary *Fold-Away* Spare Tire saves trunk space

for vacationers, sportsmen, salesmen, sports car owners





Takes only 1/5 the trunk space of ordinary spare — makes room for two more suitcases

The Gates Rubber Company — pioneer developers of many new rubber products — now makes a flexible nylon spare tire that folds down to the size of a football and eliminates the need for the ordinary spare tire and wheel entirely.

For families on vacation, especially those with the extra luggage needed for children . . . for salesmen who need more space for samples . . . for those who are going into remote areas and want the extra security of a sixth and even seventh tire . . . for owners of sports cars with extremely limited space . . . for all these and many others, Gates revolutionary new Fold-Away Spare Tire is the answer.

Actually this tire takes up only 1/5 the trunk space occupied by the regular spare tire and wheel. When the neat package containing the Fold-Away Tire is tucked in a corner, there is room for two or three more pieces of luggage. In many cars trunk space is *doubled*.

Flat off; Fold-Away on in minutes

The initial purchase of the Fold-Away tire will ordinarily include two other items: a tire changer and an inflator. The tire changer is a simple tool for removing the flat from the wheel without removing the wheel itself. And the inflator is a small cylinder of gas which inflates the Fold-Away in seconds. Anyone who can jack up a car can remove the flat tire and install the Fold-Away in a matter of minutes.

Plenty of mileage for any emergency

The Fold-Away is made with a tough cold rubber tread and a specially tempered nylon cord body. It will stand up under normal driving speeds over all kinds of roads for 1000 miles or more. Can be deflated and folded up for repeated use.

To get a FOLD-AWAY Tire see your Gates Tire Dealer or send coupon below

Fold-Away Tires are made in 14", 15" and 16" sizes to fit most cars including many sports cars both domestic and foreign. Gates Tire Dealers have popular sizes or can get the size you need quickly. If you prefer, send coupon below, giving tire size, and make of car.

We'll send price and easiest, quickest way to get your Fold-Away Tire.

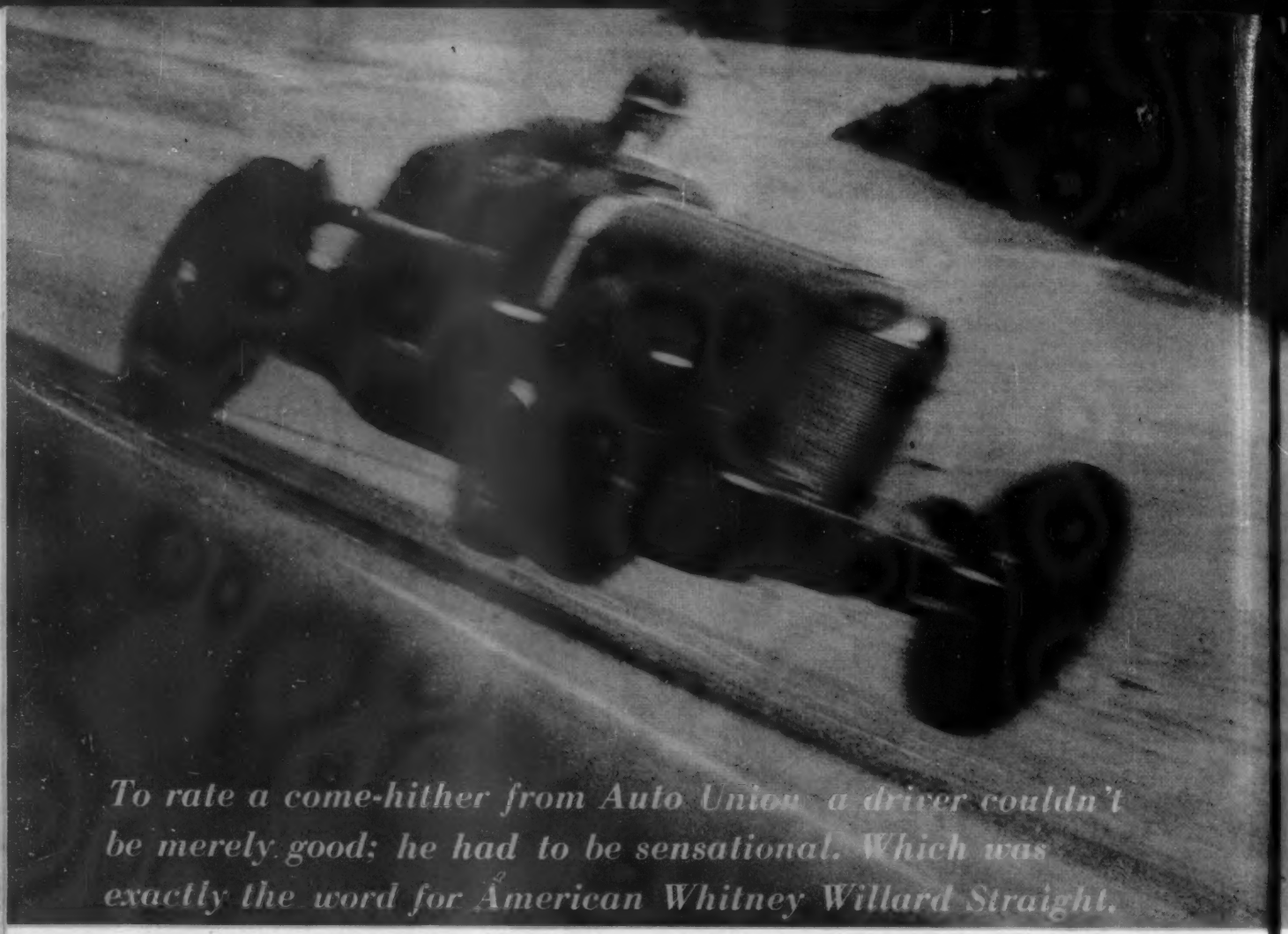
GATES TIRES

The Gates Rubber Co.
Sales Division, Inc.
999 So. Broadway
Denver, Colorado

Without obligation, send pictures and price of Fold-Away Tire for my car, together with easiest, quickest way to purchase it.

Make of Car_____
Year_____ Tire Size_____
Your Name_____
Address_____
City_____
State_____

TPA 261B



To rate a come-hither from Auto Union a driver couldn't be merely good; he had to be sensational. Which was exactly the word for American Whitney Willard Straight.

Straight always put on a good show. In '34, with an unmanageable 4.3 liter Dusenberg that had proclivities toward flight, Whitney fell only 2.15 mph short of Cobb's Brooklands lap record. He did set an unbeaten Class C record.

The Mixed-Up Galahad From Trinity College

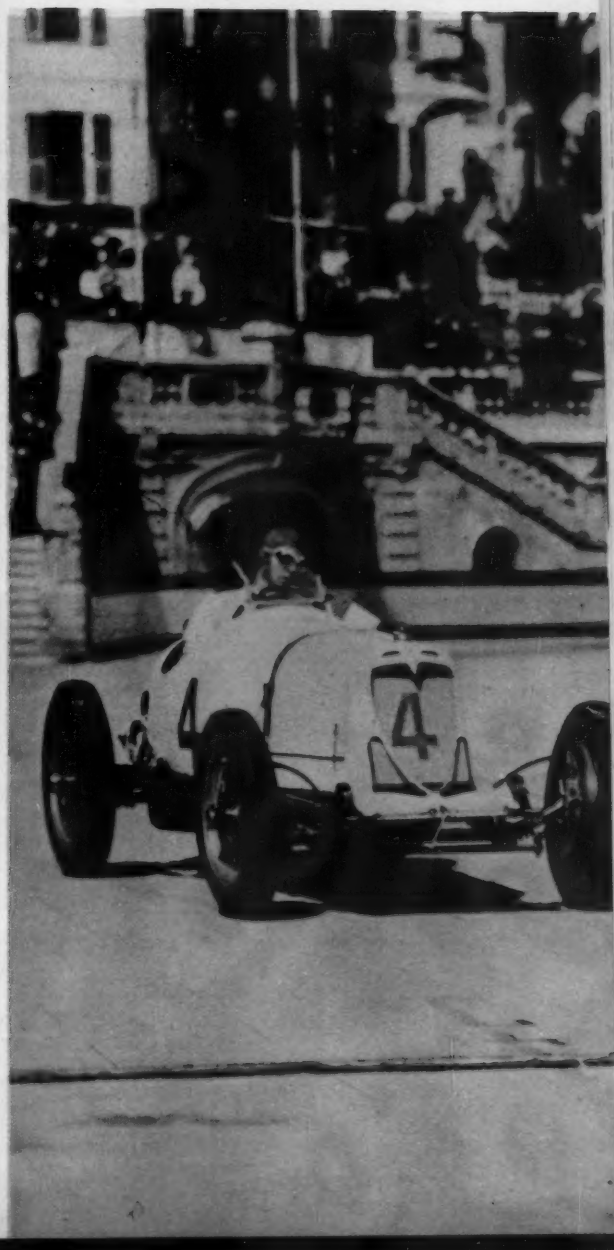
GERMANY'S prewar Grand Prix teams being primarily instruments to fillip the *Herrenvolk* fairytale, it was understandable that Mercedes and Auto Union didn't exactly trump up excuses for hiring drivers of English speaking nationalities. Contrary to the facts, it is generally believed that Britain's Dick Seaman was the only man in this category who ever signed a contract to race under the invincible swastika. Actually, the American born Whitney Willard Straight did, too.

Up to a point, but only that far, there was a background similarity between the enlistment of Seaman by Mercedes and Straight by Auto Union. The Englishman, under pressure from fond parents to resist the German bait and embrace a safer profession, hardened his heart, signed, raced, and finally crashed to his death in the 1939 Belgian Grand Prix. Straight signed first—this was in December of 1934—and did his arguing afterwards. Mrs. Whitney Willard Straight, using the leverage that is nature's endowment of young and beautiful wives, won this verbal wrestle in a single throw. Straight thereupon tendered his apologies to Herr Willy Walb, head of Auto Union's racing department, and secured a release from his agreement. He hasn't raced since.

In the six year period of Germany's state sponsored fling in the Grands Prix—1934 to '39 inclusive—Mercedes and Auto Union between them used the services of 25 drivers. Nineteen of them were German, three Italian, one French, one Swiss and one British. To rate a come-hither from Unterturkheim or Zwickau, it wasn't enough for an Englishman or an American to be good—he had to be sensational. And that's what Straight was, in common of course with Seaman. But while history does ample justice by the memory of Richard John Beattie Seaman, a generation of motor sport enthusiasts are growing up who have hardly heard of Straight.

His rise from nowhere to the top of the heap was like a tracing from a mortar trajectory. With the possible exception of Prince Birabongse of Siam, whose career only just overlapped with his, Straight learned his trade faster than any of his contemporaries. It took Seaman six years, devoted with singleminded passion to racing, to acquire the skill that won him his Mercedes berth; Straight on the other hand had been in the business less than four years when Auto Union wooed him into that stillborn contract.

In his first year of speedwork, 1931, at the age of eighteen, Whitney Straight drove in six events and finished third in



ABOVE: Aside from being an excellent and flashy driver, Straight's "Galahad Look" made him extremely popular at Brooklands with the women spectators. RIGHT: Before he became a British subject, Whitney raced in American colors (white body, blue chassis). In '34, his 3 liter Maserati rounds a turn during the Monaco Grand Prix.

By Dennis May

five of them. But as most of these were merely 1100 cc class or handicap placings (his car was a Brooklands Riley he had tuned himself) they didn't set the Thames on fire. About the only quarter in which, at this early stage, the youth made a strong impression was among female race fans, who reacted with cardiac backfires to his extreme good looks, almost bordering on prettiness.

During the following winter Straight unloaded the Riley and replaced it with a 2½ liter Grand Prix Maserati, which he bought from Sir Henry (Tim) Birkin, Britain's top racing star at that time. The effect was electrifying. During 1932, with about as much experience in his whole body as Birkin had in his big toe, Straight blasted the baronet's record for the Brooklands Mountain circuit by the incredible margin of 2.79 miles per hour. Both drivers having used the same car, this performance put their respective skills into true and awe inspiring perspective.

For 1933 Straight raised his sights and launched out into an ambitious program of British and continental races and hillclimbs; he retained the 2½ liter Maserati but widened his scope by acquiring a supercharged MG Magnette for a strike in the hotly contested voiturette field. Again the impact was stunning. With the Maserati he won the Brooklands Mountain Championship from Piero Taruffi, winner of the 1957 Mille Miglia; slashed more than 40 seconds off Rudolf Caracciola's record for Mont Ventoux, longest and most difficult speed climb in Europe; was the first to undercut Hans Stuck's record at Shelsley Walsh, a prize that had been tantalizing England's hillclimbing elite for three years; placed second in the Albi Grand Prix (he would have won it if the Bugatti opposition hadn't ganged up and subjected him to a racelong pincers movement); and set a lap record before retiring with a bust gearbox in the International Trophy at Brooklands. On the K3 Magnette at Pescara, Italy, he copped the Coppa Acerbo and, on returning to England, rounded off the season with two second places against star talent on the Brooklands Mountain course.

An American being a *rarer avis* on the Old World racing scene, and specially one combining movie-star good looks, great wealth, ancient lineage and the prowess of a budding Nuvolari, British newspapermen and magazine writers showed a wholesome interest in Whitney Willard Straight. It was disclosed, for instance, that his English forebears had for 600 years been lords of the manor at Whitney-on-Wye, Herfordshire, before emigrating to America early in the seventeenth century; they'd really only intended making a round trip of it but changed their minds and stayed over. Young Whitney's mother, widowed but now married to an Englishman, had brought the boy to England when he was twelve. In addition to his gifts as a driver, Straight was also an accomplished air pilot, photographer, painter, pianist, cellist, saxophone player, skier and underwater fisherman. Among his distinguished and/or noble kin he could count Jock Whitney, now U.S. ambassador to Britain, who is a first cousin; Lord Queenborough, an uncle; and the Hon. Dorothy Paget, another first cousin, who was Sir Henry (Tim) Birkin's backer when he was racing the famous blower Bentleys in the early 30s.

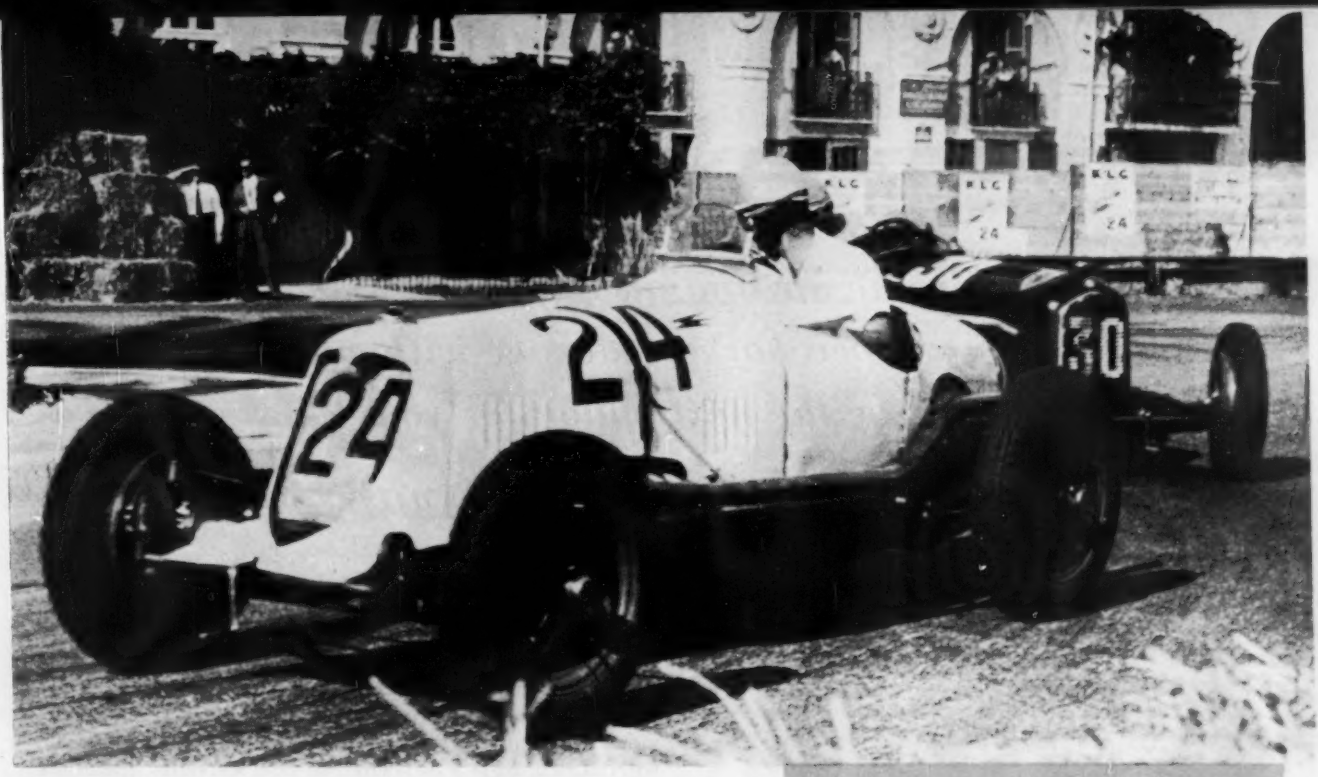
Straight was resident at Trinity College, Cambridge, where he was reading for a philosophy degree. By way of a test of his personal philosophy, a university edict was in force forbidding first year students to drive cars on the street. For private transportation he therefore alternated between a pedal bike and his own airplane, using the former for local peregrinations and the latter to shuttle rapidly between Cambridge and the various theatres of motor sport. Cost being no object, and Straight being a man who never cared to leave a stone unturned, it was his custom when flying to the circuits on a tight schedule to have himself tailed by an escort aircraft, just in case of forced landings en route.

Normally of a quiet and courteous disposition, Straight nonetheless had one raw spot: he hated allusions to his wealth. This must have kept him busy hating, because the sight of his name in a typescript was enough to set subeditors reaching for *mots* like "Boy Millionaire Race Track Idol". One columnist quoted him as saying "I often wish I never had a fortune. It is difficult to make any real friends and nobody appreciates you at your true worth".

To establish his worth in his own eyes, he once cut loose from luxury for awhile and lit out into the English countryside on an old motorcycle with less than two dollars worth of shillings in his pocket; over an unspecified stretch in the role of a mechanized hobo, he claimed he had earned 30 shillings per week (say $6.00 at the rates then operating) as a stonemason's laborer. But there were moments, it seems, when even this modest competence oppressed him; in the summer of 1933, around the time when he was just starting to louse up the luster on such names as Birkin and

(Continued on page 48)

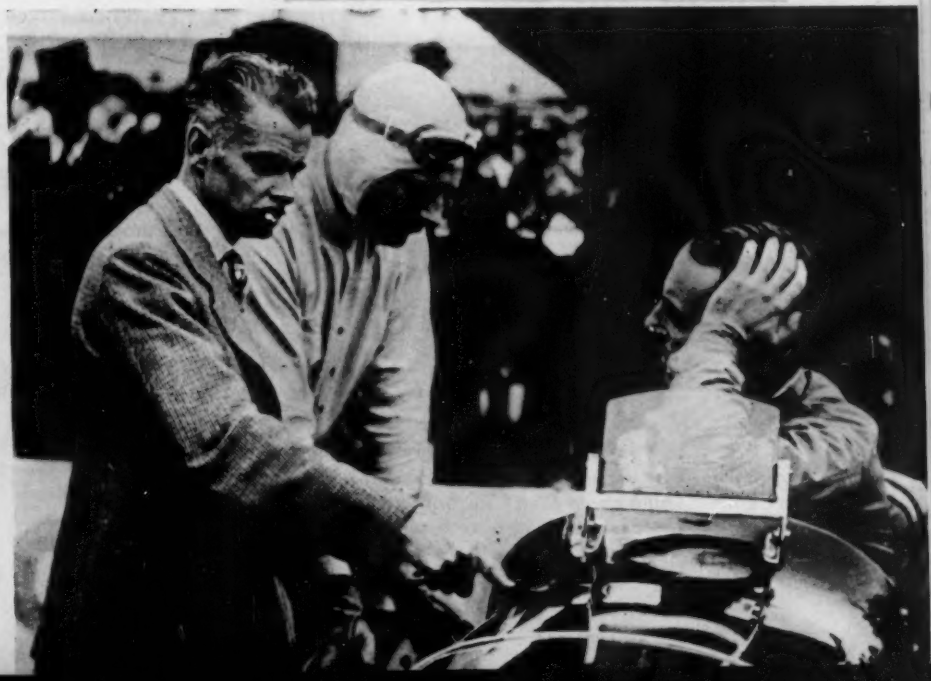
Whitney Straight on the Mont Ventoux hillclimb, longest and most difficult in Europe, taking more than forty seconds off Caracciola's record in 1933. This is the same 2.5 liter Grand Prix Maserati he purchased from, and in which he broke Sir Henry Birkin's Brooklands Mountain Circuit record by 2.79 mph the year before.



Straight, in Maserati, risks a quick look at Louis Chiron's Alfa, trailing him around a turn in the '34 Algerian Grand Prix.

Laurel bedecked, Straight sits on his Maser after winning '34 International Trophy at Brooklands. Brian Lewis was second. The other dirty face is Lewis's.

Before his competition try in an American car (the Dusenberg) Straight confers with incumbent record-holder John Cobb.

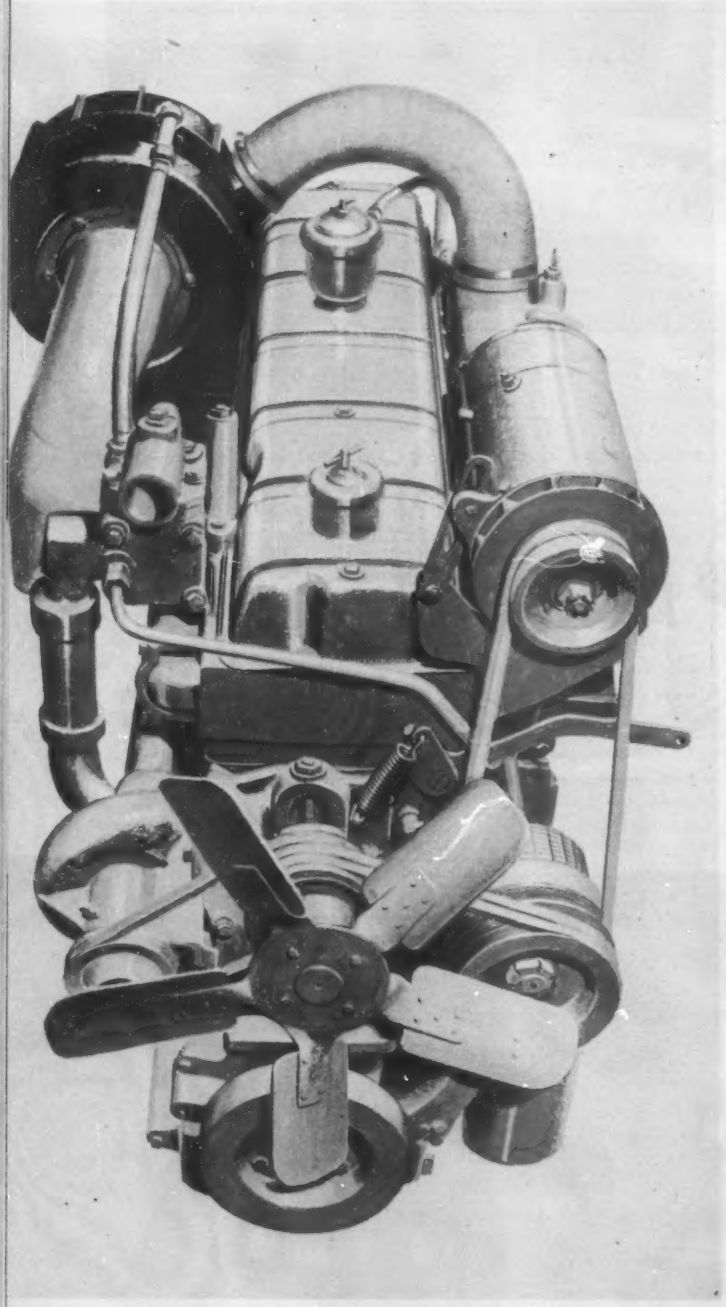


SPORTS CARS ILLUSTRATED

BOOST BY EXHAUST

Already used in the air and also at Indy, a supercharger package without gears or belts could be the next option for your car.

By WILLIAM CARROLL



Liquid-cooled turbocharger mounted to right-rear on a Cummins high-speed JT-6 "Turbodiesel". This 6 cylinder engine is rated 175 hp continuous; is considered a light, quite powerful service engine.

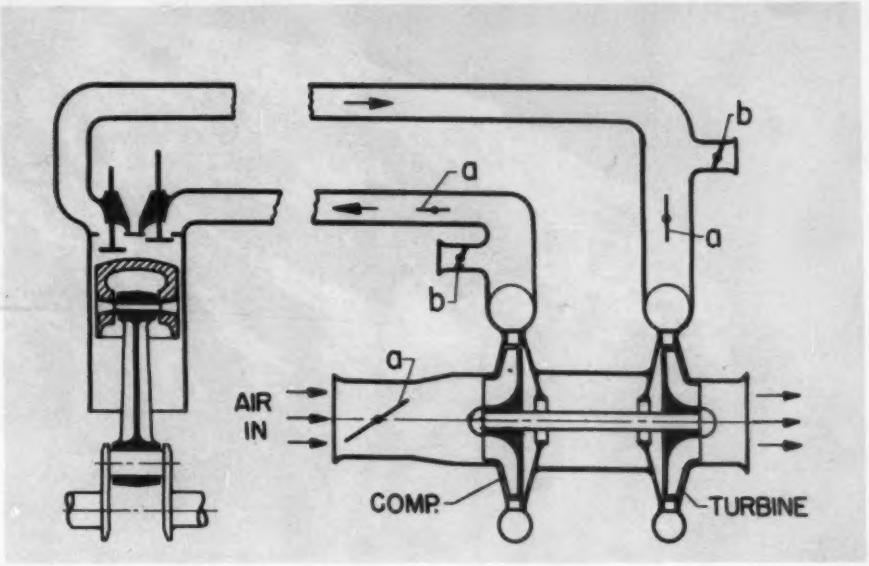
HOW would you like to use a blower on your engine that has neither gears, belts nor pulleys? It would increase gas mileage, yet steal less than one percent of basic horsepower to create boost pressure that could double the output of a well designed engine. Impossible? Not at all. For that's tomorrow's Turbocharger story.

Not commonly known is that General Billy Mitchell's famous 1925 battleship bombing might never have come off without help from a turbocharger. One scheduled operation of the bomb drop tests specified that a definite weight of bombs be dropped from an unusually high altitude. It appears that such advanced specifications were set in hopes the Air Corps could never meet them. The test would then be declared a failure. But General Mitchell's luck was still with him, for Langley Field was testing a tired Martin bomber in which had been mounted a turbocharged engine. Eager mechanics began day and night shifts while altering the bomber to meet specifications of the now famous test. Finally every bit of explosives were packed in place and the over-loaded Martin lumbered off the field's longest runway. With a turbocharger providing added power, it reached the specified altitude to drop the bombs which rocked so many arm chair soldiers right out of their trousers.

A turbocharger is nothing more complicated than a centrifugal air compressor, rotated by a turbine driven by exhaust gases leaving the engine. As the engine speeds up, more exhaust gas is available to spin the blower faster and provide additional air for combustion. The forcing of more air and fuel into the cylinders by turbocharging makes for efficient burning of the greater fuel charge, subsequently creating more power than could be obtained from a naturally aspirated engine.

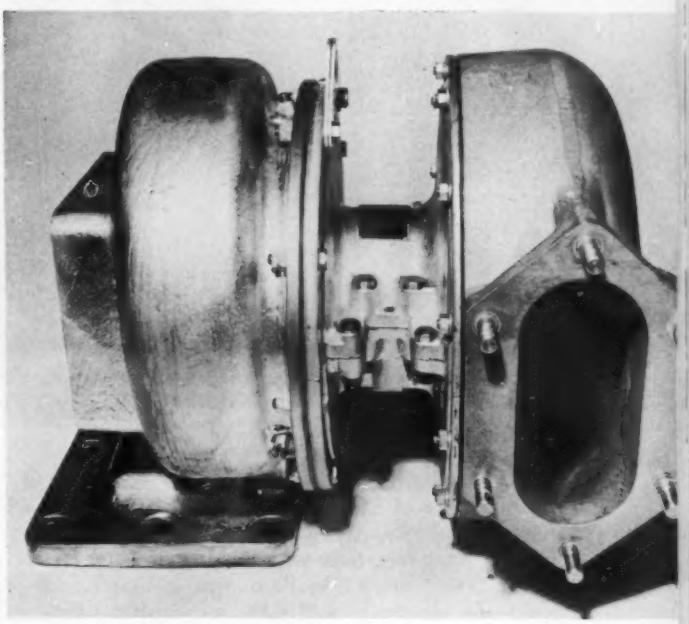
Operation of a turbocharger begins with the first hot exhaust gases shooting into the turbine chamber. Velocity (or expansion—depending on design of the turbine) of the gases, directed by vanes against the turbine blading, spins the turbine wheel. As the turbine rotates on a single shaft, to which the air compressor impeller is also mounted, the used exhaust gases are ejected into an exhaust pipe. At the same time, the spinning air impeller is drawing air at atmospheric pressure into the compressor air chamber where it is picked up by blading on the impeller wheel. Rotating at high speeds, the impeller blading forces air outward into the air casing. Velocity of air passing through the impeller determines air pressure in the casing, which is vented to the intake manifold or pressurized carburetor. The end result being an air/fuel mixture of greater than atmospheric density rushing into the combustion chamber every time an intake valve pops open.

The automotive background of turbocharging is somewhat limited. For so many years "more power" was just a question of casting larger chunks of iron. Today, engineering "pay dirt" lies in compact production power plants of greater power per cubic inch than was dreamed possible 20 years ago.



Schematic of turbocharger installation. Depending on application, system control is by throttling (a) or by-pass (b). Though turbos now generally operate with fuel injection, pressurized carbs mounted ahead of compressor work well, too.

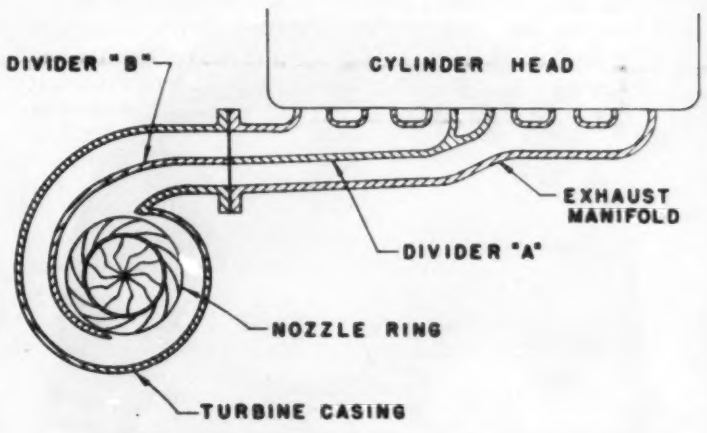
Monster T-30 Garrett Turbocharger used on locomotives. Weight is 135 lb.; output 70 to 95 lb./min. A smaller T-10 model weighs 39 lb.; delivers 25 to 40 lb./min.



Fortunately, in 1944 Dr.-Ing. W. T. Von Der Nuell, (now Director of Turbine Engineering for the Garrett Corporation) and his fellow European workers, began development of a small exhaust turbocharger for engines of the Ford and Chevrolet class. Their research sprung from wartime fuel shortages, and a European trend toward use of coal or wood gas generators. The problem was that at 3000 rpm power output of an Opel-Chevrolet engine dropped from 72 horsepower with gasoline to a mere 33 horsepower with wood generated gas. A radial type turbine with a variable nozzle area was tested in 1945, resulting in extremely satisfactory turbocharged engine performance. Horsepower increased from the previously mentioned 33 to over 50 and torque jumped from 87 to 119 lbs.-ft. A novel mounting arrangement required only that the Chevrolet exhaust manifold be turned upside down, the turbine bolted in place and tied to oil lines for cooling. Performance of the tiny unit reached an over-all efficiency of nearly 30% with a maximum rotor speed of 80,000 rpm.

In 1952 a turbocharged Cummins Diesel entered the 36th Indianapolis 500 mile race, in which Cummins' engineers were exploring the far reaching potentials of an exhaust driven turbocharger. This unusual car, driven by Freddy Agabashian, was powered by a horizontal six cylinder 401 cubic inch experimental diesel engine. With a bore and stroke of 4⅛ by 5 inches, the four cycle engine produced over 350 horsepower at 4,000 rpm. An unusual driving problem faced Agabashian, since the turbocharged diesel accelerated rather slowly. To maintain speed he had to enter the turns with a nearly wide open throttle. The trick was to keep his engine rpm's high, while braking to a

(Continued on page 50)



Dividers in both the exhaust manifold (A) and the turbine casing (B) give a significant improvement in scavenging, and lower the exhaust temperature. The engine can safely be up-rated by 75%, without exceeding the permissible exhaust temperature.

FIG. 7 - EXHAUST MANIFOLD & TURBOCHARGER ARRANGEMENT

Although Stuttgart is several hundred miles away, the Porsche is completely at home in the Swiss Alps. Negative camber of the rear wheels helps tame "dreaded oversteer".

It pays to read the fine print on the stern before dragging with this bomb.

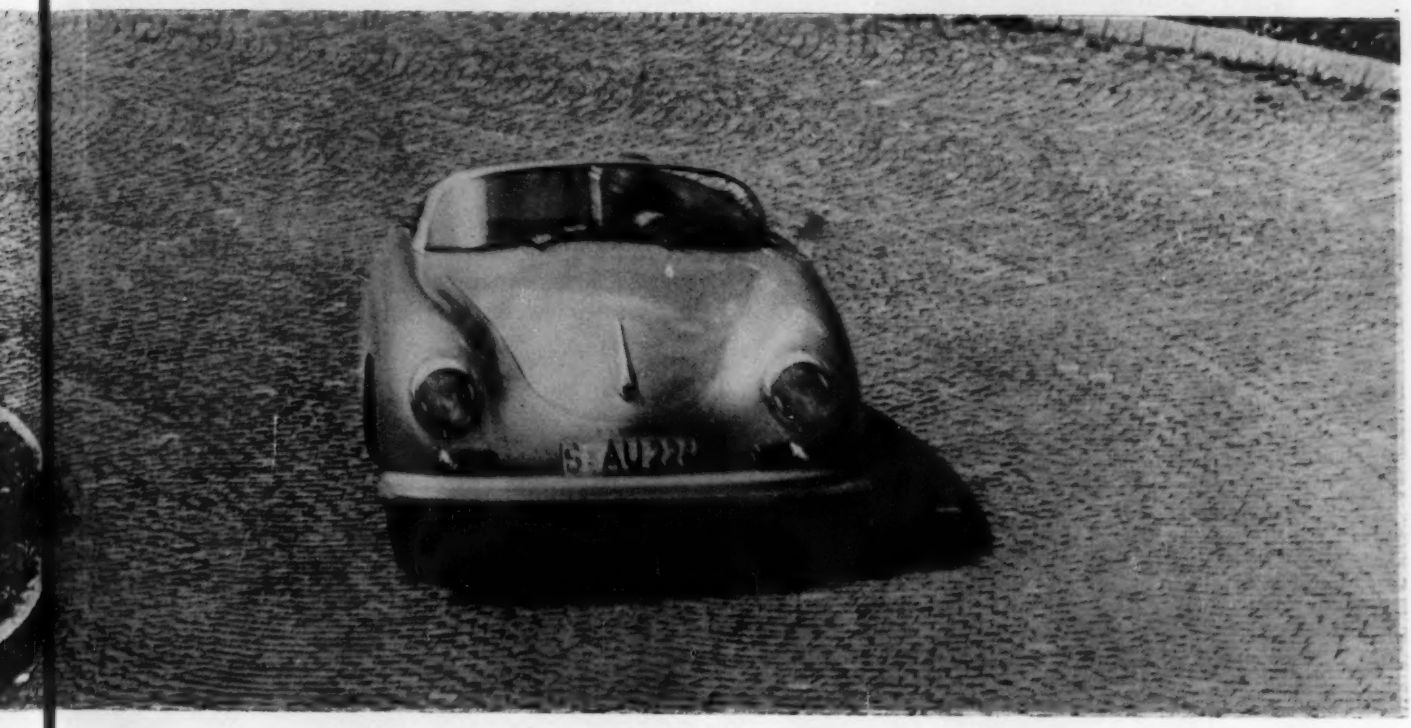
IN the autumn of 1955 Porsche introduced the Type 356A, to supplant their tried and trusted Type 356. As well as redesigning the integral body-chassis to suit the car for the increased production envisioned, they had considerably modified the front-end geometry with a thicker anti-roll bar, longer torsion bars, and a new steering damper. At the rear the chassis was extensively changed, permitting vertical installation of longer and heftier shocks. The spring rates were decreased all around and as a result the personality of the car was completely changed; some said for the better, others for the worse, for one could no longer "wischen", and the steering was far from as light as before. A good many Porsche drivers looked at the new car with a bit of scorn. They seemed happy enough about the new windshield and dashboard, and of course the 100 extra cc's made the car go faster, but it was sort of like the MG TC vs. the TD. Well, two years of production and a good many miles later, most people feel that the 356A goes and handles better than any other Porsche ever built.

This Spring slightly modified type 356A's began to roll off the production lines at Stuttgart-Zuffenhausen. Rear lights had been restyled along with other minor changes to the interior, new color combinations were made available, and then "joy for enthusiasts" mixed with "gloom in Westport," as a lighter, more powerful Carrera was put into production. Dubbed the "Carrera Gran Turismo", the new car, which has 128 bhp (SAE), complements its older sister

SCI ROAD TEST:

PORSCHE CARRERA GRAN TURISMO

Cornering vigorously seems to be bred into Porsches, and where better to exercise one than in an Alpine hairpin?



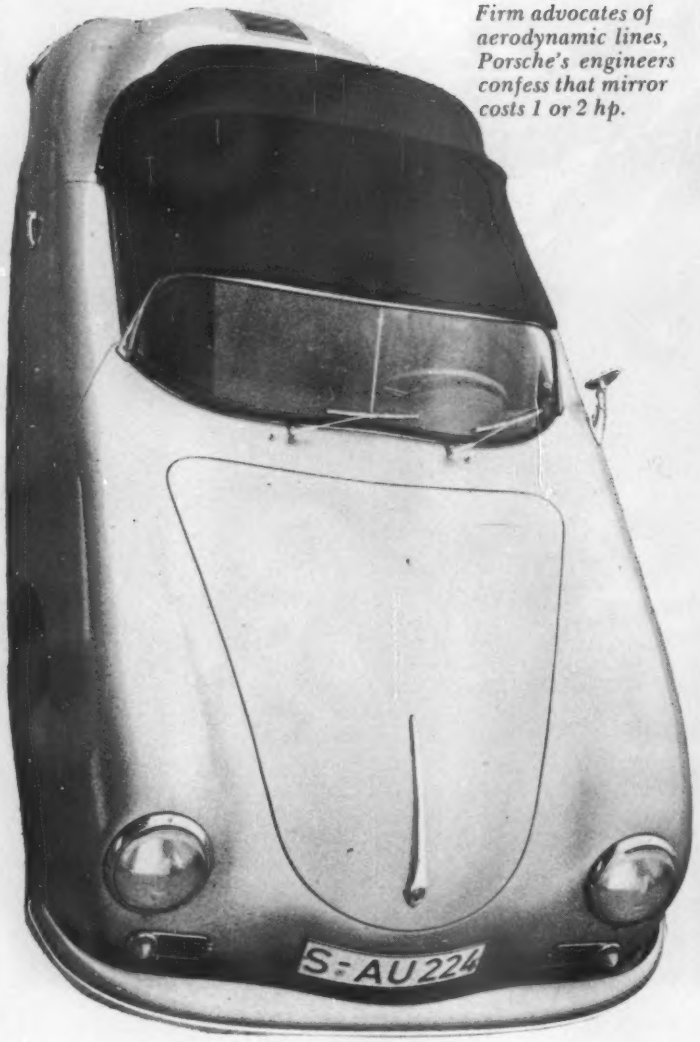
the "Carrera de Luxe". Both are powered by the 1500GS engine, but the GT car is tuned and lightened for competition and comes only as a Speedster such as we tested, or a coupe like the one that ran at Sebring. The Carrera de Luxe gets by on a mere 110 horses and is a comfortable, relatively-quiet, high-speed touring car available in the three "ordinary" bodies: coupe, cabriolet, and Speedster.

If there ever was any doubt in your mind about what constitutes a sports car, take a long look at this new Carrera; it fits anybody's definition. Not only is it capable of winning its class hands down on a Sunday afternoon airport race, but it will pack two kids and bags of groceries from the neighborhood store almost as easily as the family sedan, and you'll have a whole lot more fun in the process. But don't misunderstand, for the new Carrera was designed to GO first and to transport kids second. Here is a 1500cc sports car which turns an honest 125 mph and goes from 0-60 in 11 seconds or less. Lighter than the previous Carreras by 143 pounds, it has 18 hp more and in traffic is smoother and more agreeable than the conventional push-rod Porsche.

One reason why is that Solex has designed a new double-choke downdraft carburetor, the 40 PJJ4, which gives the twin-cam 1500GS engine greater flexibility than was hitherto known in sports cars especially designed for competition. But despite this docility you've got absolutely brutal acceleration waiting quietly until needed, as output of the GT's mill equals that of the old production Spyders at one less compression ratio. The owner of a GT will never have to worry about having Detroit-ware run away from him, with the possible exception of the Chrysler 300C. For those who would rather eat 300Cs than groceries, the optional at-extra-cost Weber carbs are recommended.

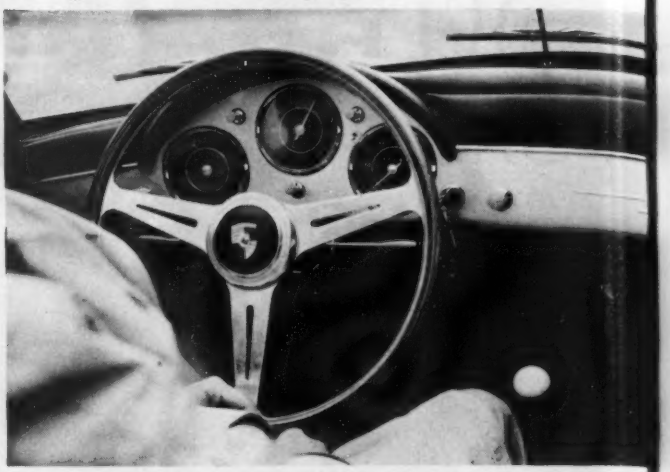
The Dr. Ernest Fuhrman–designed engine has twin overhead camshafts on each bank of cylinders, dual ignition, and a dry sump lubrication system. The Hirth roller-bearing crank runs in four main bearings and will rev consistently to 6500 rpm. If you're really pressed, 7500 can be had safely for brief periods. At 91.4 cubic inches, the Carrera is a masterpiece of small engine design, reliable as well as extremely powerful.

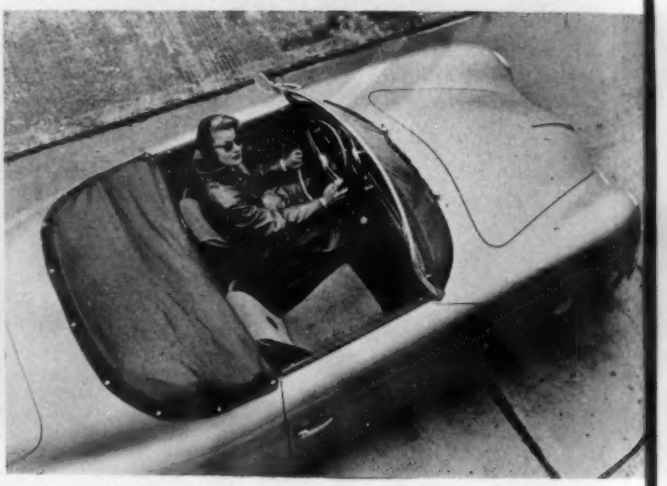
The Carrera GT Speedster looks its part; slim bucket seats set between two light-weight doors, the wooden Italian steering wheel, and the sparce simplicity of the car tell you what it's for. The rear seat has been removed, there is no soundproofing around the engine, and the heavy plastic-base undercoat has been omitted. The bumper rubber strip is gone, and except for the windshield all windows are plexiglass. Up front, beneath the hood, is a 21 gallon gas tank. The combined heater-manifold has been left off, replaced by a "sport auspuff" system that does nothing but exhaust. This Carrera GT is a noisy machine at high revs. At 5000 rpm she is just about giving her maximum torque of 87 foot pounds, and you are advised of this by a shatter-



Firm advocates of aerodynamic lines, Porsche's engineers confess that mirror costs 1 or 2 hp.

"Form follows function." Attractively simple control layout is well-arranged for competitive driving, unencumbered with gadgets.





"Coming my way?" All Speedsters are made with bucket seats which give excellent lateral support, but reclining ones are available at extra cost (and weight).

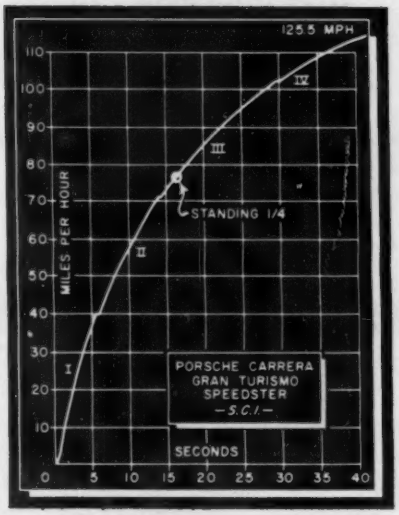
ing blast of sound that sends chills up the spine of the uninitiated.

Getting into the car is a cinch with the top down. Top up, however, a six-foot-five man would have to crawl in on hands and knees. It is ridiculously easy to raise and lower the cloth top, and it makes one wonder where others have been all these years. The plastic side curtains are simple and straightforward, too, doing the job of keeping out all the rain. The car cannot be driven over 50 mph with just the top up, for the pounding and slapping of the wind is too much; with the Speedster it's either all open or all closed. In the latter case, wind noise is bothersome. The electric wipers seemed adequate enough, though let's hope Porsche engineers have licked their old problem of throwing off wiper blades.

Starting technique is simple. First, all three switches on the dash just below the tach have to be pulled out; one each for the right and left distributors and the other one for the electric fuel pump. If it's cold, two or three preliminary punches on the gas pedal will prime the engine, and with the pedal half way down the engine will start immediately. Warm starts can be difficult. The gas pedal should be pushed to the floor and held there until the engine starts. No pumping!

It's hard for a conventional Porsche driver to get used to the fact that the engine smoothes out at about 4200, right where a pushrod Porsche would be getting rather wound up. At 5000 rpm in the Carrera things start to happen, and from there on up you've got that feeling of being pushed in the small of the back. The acceleration is accompanied by the most unholy snarl of power you ever heard, and in the soundproofed version of the Carrera you would think you were in a Spyder. After completing our acceleration runs the clutch began to show more than a little slip, a none too surprising weak spot in a car descended from a 25 hp utility sedan.

The ability of this automobile to get itself in and out of tight spots in everyday traffic was fabulous. Passing could be done in complete security—the car being maneuverable as well as just fast. Cruising speed is anything you want to name—a docile 45 or a fleet 85—or more. The range of speeds in the gears is amazing, 40 mph in first, 70 in second,



Size of trunk lid is generous in relation to volume of luggage which may be stored thereunder. Baggage in background was carried behind the seats.

and 100 in third, figures hard to believe until one gets behind the wheel and experiences it. The Porsche patented servo-synchromesh proved to be as perfect as ever, except when the oil in the gear box was cold.

In fast bends, the car neutralsteers as long as the driver gives the right amount of throttle. The Carrera Gran Turismo can be thrown happily through a series of Alpine hairpins with wild abandon, the steering being quick and precise. No road shock is transmitted to the driver, thanks to the damper now fitted to all Porsches. One degree of negative camber at the rear wheels plus the use of factory recommended tire pressures seems to be the answer for making a Porsch handle satisfactorily; altering pressures and/or make-of-tire can change a Porsche's personality completely (especially in the wet) our test car came with Continental racing tires; 20 psi in the front and 24 in the rear proved suitable for all highway touring conditions. The factory recommends greater pressures when racing, the exact amount being left to the driver. Tire noise was not excessive even under harsh cornering.

(Continued on page 66)

PORSCHE CARRERA GRAN TOURISMO 1500 GS SPEEDSTER

PERFORMANCE

TOP SPEED:

Two-way average	125.5 mph
Fastest one-way run	126.0 mph

ACCELERATION:

From zero to	seconds
30 mph	4.2
40 mph	6.5
50 mph	8.5
60 mph	11.1
70 mph	14.0
80 mph	18.0
90 mph	22.5
100 mph	28.2
110 mph	36.0
Standing ¼ mile	16.5
Speed at end of quarter	76 mph

SPEED RANGES IN GEARS:

I	0-40 mph
II	10-71 mph
III	15-102 mph
IV	25-Top

SPEEDOMETER CORRECTION:

Indicated	Actual
30	29
40	39
50	48
60	58
70	67
80	78
90	89
100	99

FUEL CONSUMPTION:

Between 10-18 mpg, depending on how car is driven.

BRAKING EFFICIENCY:

(10 successive emergency stops from 60 mph, just short of locking wheels):

No apparent fade

SPECIFICATIONS

POWER UNIT:

Type	4 cylinder opposed, air cooled engine
Valve Arrangement	Inclined valves, four bevel gear and shaft driven camshafts
Bore & Stroke	3.35 x 2.60 ins. (85 x 66 mm.)
Stroke/Bore Ratio	0.78/1
Displacement	91.4 cu. ins. (1498 cc)
Compression Ratio	9/1
Carburetion by	Two 40 PJJ-4 Solex double-choke down draft
Max. bhp @ rpm	128 @ 6400
Max. Torque @ rpm	91 lbs.-ft. @ 5200
Idle Speed	800 rpm

DRIVE TRAIN:

Transmission ratios:	
I	3.09
II	1.77
III	1.23
IV	0.96
Final drive ratio (test car)	4.43 (4.25 in top gear)
Other available final drive ratio	4.86, 5.17
Axle torque taken by	Rear end housing mounts

CHASSIS:

Wheelbase	82.7 in.
Front Tread	51.4 in.
Rear Tread	50.1 in.
Suspension, front	Trailing link, laminated torsion bars, anti-roll bar
Suspension, rear	Trailing arm, swing axle, torsion bars
Shock absorbers	Telescopic
Steering type	Worm and sector with steering damper
Turning diameter	36 ft.
Brake type	Front—Spider brakes, Rear—Normal Porsche brakes
Brake lining area	148 sq. in.
Tire size	5.90 x 15

GENERAL:

Length	156 in.
Width	65.7 in.
Height	48.1 in. (coupe: 51.6 in.)
Weight, test car	1851 lbs.
Fuel capacity—U.S. gallons	21, including 4 gal. reserve

RATING FACTORS:

Bhp per cu. in.	1.40
Bhp per sq. in. piston area	3.62
Torque (lb-ft) per cu. in.	0.99
Pounds per bhp—test car	14.4
Piston speed @ 60 mph	1895 fpm
Piston speed @ max bhp	3575 fpm
Brake lining area per ton (test car)	169
Mph in top gear @ 1000 rpm	17.8

GEORGE BEAVIS *was a founder of Triple R but dropped this in favor of his Grand Prix Register, devoted to stimulating FIA F1 and F2 racing, professionally, in the U. S. In his youth in Australia Beavis became a convert to racing equipment of the finest class. It can't be operated, he contends, except on a go-for-dough basis.*

NIEL "WHITEY" THUESEN *is vice president of Road Racing Register, a club whose members reject on principle racing for free. He began racing midgets at the age of 18 and has been a mechanic and car owner, professionally, for the last 20 years.*

BILL POLLACK *is a member of the CSCC's board of governors, a prominent racing driver and an influential intellectual force within the sport. He speaks with the authority of a front-rank contestant and sports car club executive of many years' experience.*

DUANE CARTER *is president of United States Auto Club, successor to the Contest Board of the AAA. He is a veteran driver at Indianapolis, on the Championship Trail, and in the Mexican Road Race. Now he has the responsibilities and viewpoint of the club that represents Big Time pro racing in the U. S.*

JOHN EDGAR *is a wealthy sportsman who has supported road racing ardently and expensively since its beginnings in the post-war U. S. He owns a large stable of thoroughbred race cars, now is a chief investor in the colossal Riverside Raceway.*

KEN MILES *also is a member of the CSCC's board of governors, is president of the American Racing Drivers Club and one of our finest under 1500 cc drivers. He raced actively in England before coming to this country after World War II. His background is remarkably broad, his stature within the sport exceptional.*

MODERATED BY GRIFF BORGESON

Will U.S. Road Racing Go Professional?

Pressure is mounting against simon-pure amateurism. SCI presents a panel discussion on the controversial subject of "go for dough."

THE FOCAL point of road racing activity on the North American continent is Southern California; it's probably no exaggeration to assume that as this area goes, so goes the nation. And to careful observers of the West Coast scene there have been a lot of straws in the wind apparent for roughly the past year, all of them pointing in the same direction: away from simon-pure amateurism and toward Big Time professionalism. A revolution is undoubtedly brewing. To acquaint you with the forces and conditions surrounding it, SCI presents the panel discussion that follows. It's likely to jolt you.

Let's start this with the question that counts, gentlemen. What's your feeling about pro road racing?

BOTHWELL: SCCA's official policy is that pro drivers can't drive in our races unless they haven't driven pro for over a year. That is they can't drive *with* our amateur drivers. But there's no rule against their driving for no purse in a charity event in their *own* race, one specifically for pros. This is probably the way that amateur-pro integration will begin in the club, and there are plenty of people in SCCA who are ready to see it begin right now. We have been considering various possibilities – running alternate pro and amateur events on the same day, for example, or running pros one day, amateurs the next. Professional road racing is coming, I'm convinced. It's just a matter of time. It's up to us to see that the control we now have over safety for contestants and spectators is not just maintained but improved.

CARY: The trend is toward the closing of the gap that has separated pro and amateur events for so long, and the old anti-pro feeling in top SCCA circles is just about dead. This is why I organized the New Smyrna Beach race as I did. Ed Walsh, SCCA Activities Chairman, gave the club's drivers clearance to compete against pros in this no-purse race. NASCAR drivers were also cleared to drive and the Corvette and Thunderbird people were there with their own pro pilots. New Smyrna came off perfectly well and I planned to apply the same amateur-pro formula at Palm Springs last March and at the Hawaiian race in April.

But the idea was turned down by SCCA national headquarters – not on grounds of anti-pro prejudice, but because there was no machinery set up for assuring that other groups' licensing procedure and technical requirements would be up to SCCA safety standards. This problem doesn't exist between SCCA and CSCC, for example; we've competed together for years and have confidence in one another's safety precautions. When a similar understanding is worked out with the pro groups one of the biggest obstacles will have been overcome. Then we'll be likely to see some big changes in U.S. road racing.

POLLACK: I feel that professional racing is in the immediate future. Sebring is a glaring paradox. Every amateur club has a rule saying that you *are* a pro if you race with pros within the continental limits of the U.S. Yet we drive at Sebring, and because of Sebring's FIA status everyone ignores the rules. If you can get FIA status for other races in the U.S. no club can say we can't run in them. The precedent has been set at Sebring.

GEORGE CARY *is a pioneer road race organizer and promoter in Southern California but his range of activity extends from the Hawaiian Islands to Florida. He manages SCCA events in the So. Cal. region, is a veteran in this field.*

LINDLEY BOTHWELL *is Regional Executive of SCCA's Southern California Region. Bothwell has been associated with the AAA Contest Board and USAC for years, has a fantastic collection of historic racing cars, has been called "the one man who can do the most for SCCA in California." He's a wealthy rancher and sportsman in many fields; he knows the amateur and professional sides of many sports intimately.*

We're not afraid any more of having Indy drivers come to our races and clean up. We've seen in almost every situation that they're no better off on a road course than most other drivers who have just started with a minimum of our kind of experience. The oval-track pro is good or bad according to his ability to adapt himself to our kind of racing.

Another factor that's bringing professionalism closer is that the stigma once attached to pro drivers in this country no longer stands. Now we're all called race drivers, whether we're amateur or pro, and names like Fangio and Moss are becoming respected household words. People are beginning to feel that road racing produces a different breed of driver than crash-and-burn jalopy shows.

We do feel strongly that pro racing should come through the experienced sports car clubs, with the same guarantee of professional operation of the events. We guard very jealously the corps of drivers that sees fit to compete with us and if we should decide to promote a pro race we would not sacrifice any of the safeguards that have inspired their confidence. If the CSCC could get FIA sanction for a race at one of its road courses there would be nothing wrong with holding a pro race there. But if we were to offer $500 starting money for no apparent reason, this would be nothing more than an outlaw move. We have to operate within the framework of existing authority.

CARTER: I think that one of these days soon many of the present sports car amateur drivers are going to be pros. Right now amateurs and pros rub elbows in major events with no strain at all. Some of the owners of costly road-racing equipment keep top "amateur" drivers on a payroll, so it's already a kind of academic question. There's plenty of room in the sport for those who want to drive pro and the others who don't want to run quite so hard.

EDGAR: In the boat-racing sport in this country back in the Thirties we suffered through the amateur-pro controversy for years. Then we fixed it – very simply. The hassle has been a dead issue ever since. It was ruled that amateurs and pros should run separately during the same regatta. There were times when the entry field was too crowded to permit sorting them out. Under those conditions both classes ran together. The pros took their money and the amateurs took their trophies. Two changes of status were allowed: from amateur to pro and from pro back to amateur, if a guy changed his mind. This is *an* answer to the problem. I'd like to see something like it worked out for our road-racing sport.

In this country we take much of our inspiration in road racing matters from England. What is the amateur-pro situation there?

MILES: There never has been in the history of motor racing in England any distinction between an amateur and a pro. Racing is an old sport there, dating back to the beginning of the automobile, when all competitors were wealthy owner-drivers. As the sport developed and factories entered into racing there was still, up until recent years, an excellent chance for the owner-driver to win against the paid driver. So the question never came up. In England a pro driver is considered to be a man who earns his living exclusively by racing, and there are many who do. One might say that Moss is a pro driver. In England the drivers who are novices compared to Moss are proud to race against him and learn something from him – no matter how purely amateur they are.

That's one aspect of the situation. Another is that in all events in England, even the junior events, there usually is the possibility of picking up something in the way of money. Because of the substantially lower cost of putting on an event in England and the far greater supply of volunteer help, a small organizing club can stage a race for very little money and a good portion of the entry fees can be used as prize money or starting money. Furthermore, accessory and oil companies offer a contract at the beginning of each year to most competitors – even those with a very small reputation. Let's say I run at a club meeting at Silverstone which happens to be on the manufacturers' list and I get a class win. Then the manufacturers of various products will each pay me a small piece of money as a bonus for using their products and winning with them. In exchange for this they may use my name in their advertising. Even the newest club member, after he's raced enough so that people know his name, can pick up a little money here and there, and it's considered the acceptable thing to do. The clubs themselves usually pay very small sums of money – $5, $10 or $15 as place money, with a first prize of perhaps $50 or $100 for the feature event of the day.

It's obvious, then, that the English clubs don't have this "can't race with pros" rule. Now what's all this about mixed pro and amateur racing in the U.S. being possible only when an event is FIA-approved?

MILES: Those of us who hold FIA licenses could lose them for taking part in an event that has not been approved by the FIA. This is not likely to happen while we're racing in the U. S., largely because we have no sanctioning body that is affiliated with the FIA. There is nothing to stop a club from staging an event inviting pro drivers to compete. The club needs no FIA approval to do that. And if the visiting drivers happen to hold NASCAR licenses the only people likely to object are NASCAR.

As it stands at this moment the can't-race-with-pros rule has, in my opinion, a certain merit. It enables the SCCA and CSCC to have a measure of control over the backyard promoter. The danger to the sport in this country, as to the midget racing program or any other, is not the Agajanians and other reputable promoters but the operators who will promote a so-called Grand Prix race on an oval track for the sole purpose of making a quick buck and with a minimum of regard for the interests of contestants and spectators. I feel that if a promoter of Agajanian's caliber would stage an FIA-approved purse race that the CSCC and probably the SCCA would approve their members running in it. Anything we do along these lines will be done in cooperation with the SCCA.

Pro racing was launched on the Coast some time ago by Road Racing Register. What progress has that group made?

THUESEN: To date we find that the biggest problem is finding courses to run on. We've used oval tracks only because we had no other place to race. Our last race was held on the Willow Springs road course in February. It was raining hard throughout Southern California yet we drew 62 entries and about 5000 spectators. The races were good and we were vastly encouraged. We now have over 100 members. Our board is composed almost entirely of businessmen and the club is being run in a businesslike manner. We have had discussions with the SCCA concerning our participation in no-purse races,

with the proceeds to go to charity. We're all for it and will cooperate wholeheartedly with the amateur clubs. The next move will have to come from them.

George Beavis left Triple R to organize Grand Prix Register. Why, George?

BEAVIS: My personal enthusiasm happens to be for the all-out Formula 1 and 2 pro racing and I felt that there were others in this country who would also be interested in racing on this level professionally, starting with Formula 2 machines. This proved to be true. Many well-known people in the sports car field have indicated a strong desire to build or buy F2 equipment, and quite a few owners of first-class Indianapolis cars seem interested too. The only way we're going to be able to get started, though, is by holding our own events in conjunction with races organized by the big amateur clubs. We've been approached by one of them and the welcome mat seems to be out.

In the light of what you've all said so far it's evidently just a matter of time until we have both pro and amateur racing in the U.S. This is bound to create new problems. What are they likely to be?

MILES: When you run for money the big question is where does the money come from. I've mentioned the modest prizes that clubs offer in England. But the situation is very different here because the clubs just plain can't afford it. The attendance at races is much lower here and help costs a lot more. The expense of putting on a race is very high.

CARY: Exactly. The permanent racing circuits in England make a world of difference in staging an event economically. You can't set up a course like Palm Springs and then have enough in the gate to pay expenses and also set aside some 25 to 40 percent for drivers. The basic cost of setting up that course and taking it apart is about $5000 in itself, not including rental for the property. If you can open the gate and start selling tickets with $1000 of overhead that's one thing; but when it costs $5000 just to set up the course it's a vastly different situation.

POLLACK: Besides, nearly every course is going to present its own individual set of problems in negotiation. Where we have a privately owned course like Paramount Ranch there's no difficulty. But when you're depending upon local sponsorship and cooperation from the Jay Cees or the Firemen and if you're on semi-public ground like a county fairground there are distinct negotiating problems. The state may permit amateurs to play on public ground but frown on a money-making proposition.

CARY: And remember that many sponsoring service clubs or civic groups insist upon control of the concessions. If these can be controlled by the promoting club there are much better prospects for profits and purse money.

BOTHWELL: I strongly believe that we're having too many races here in California to draw big crowds and big gate receipts. And we have to operate at a profit to cover the times we're rained out and lay a multi-thousand-dollar egg. Eight, ten, fifteen thousand is not a big crowd; you've got to have fifty thousand and more. But until everyone in racing gets together and works out an integrated plan we're going to stay in the same rut.

My opinion is that racing is a lot like baseball and you've got to have a ball park before you can have a ball team. If we had a big ball park, a real one, I think a lot of our problems would be solved. We haven't any place that can hold the people that can be accommodated at Watkins Glen or Elkhart, where you can take care of 100,000 people. With something like that we could work in close cooperation with other groups and have pro racing one day and amateur the next. I think the people would show, the pros would make their dough and the amateurs would get their cups. Once everybody got used to the idea they'd probably be teaming up in open events, just as they do in big time golf. I think some of the amateurs would give the pros all they wanted. I'm not so sure they're going to give guys like Johnny Parsons all they want.

EDGAR: Well, as you know I'm one of the guys that's building the big ball park. It's near Riverside, 65 miles from Hollywood and Vine and 114 miles from the center of San Diego. The country isn't desert; it's rolling ground and from several areas spectators can see the entire layout. The grading is completed and we're now paving. There are seven circuits ranging from a very small one where novices can work out to a 5.2-mile Grand Prix course. I've gone over the plans with prominent European race car manufacturers and drivers and they're all in love with it.

We can handle immense crowds there. We'll hold an SCCA race some time this summer and I promise you it will be better than anything ever held on this coast. There is *no* reason why we can't get FIA sanction for an international Grand Prix race and that's one of our first objectives. This country is too big to have only one Sebring.

We will tolerate nothing but first-class equipment and first-class racing. USAC has already applied for six dates per year. We're starting out with an investment of about a half-million, and with temporary stands. As the plant begins to pay its way we'll go to permanent stands. We plan a total investment of about $2½ million.

CARTER: If the Riverside course is executed in a third-rate way it won't help much even though the location and approaches seem perfect. But if it turns out to be a quality plant like Santa Anita it will be the biggest boon to racing — amateur and pro — that Southern California has ever had.

SUMMARY: Professional road racing with amateur club cooperation and support seems to be in the near future. It will not affect the popularity or the worth of amateur racing. The leading amateur clubs are not opposed to this development; they contain elements that are very sympathetic to it.

The major obstacle at this point is the establishment of uniform licensing and scrutineering standards. The FIA's attitude need not be a factor in the staging of separate pro and amateur events or even in mixed events. England, the country to which we look most for guidance, makes no issue of amateur or pro status. But it's essential to the welfare of the sport that when pro racing gets major-club blessing there be no sacrifice in safety precautions.

Starting money and place money will create entirely new problems for amateur race organizers, and it will take time to solve these. Big time racing will require big time racing plants. These exist in the eastern U.S. and one at least is nearing completion in the west.

The big news, though, is that we are apparently on the threshold of a logical and existing evolutionary development in U. S. road racing. It can lead to big things — certainly as big as racing in Europe.

The Jaguar 3.4 sedan develops a rather frantic lean as it goes through a fast bend at 65 mph.

WHAT with an exorbitant purchase tax, high gasoline prices and other economic factors, it's not easy for the average Englishman to lay out cash for a new car; that's why a lot of British firms are concentrating on the export market. Jaguar Cars, Ltd., with their 3.4 sedan, have a vehicle that is designed explicitly to appeal to Americans. Americans with money.

The Jaguar 3.4 might be considered Britain's answer to the domestic high-performance cars, such as the Studebaker Golden Hawk, Plymouth Fury, et al. In many ways it is superior to these, and in no way really inferior. Certainly it lacks the massive bulk of its American counterparts; body, engine and interior workmanship is more finished; and the automatic gearbox does not seem as sloppy as most that we have encountered. Its handling and riding qualities are excellent, with a couple of exceptions that will be noted later.

All doors on the 3.4 open wide, and stay open, permitting easy entry to front or rear seats. Head and leg room is excellent both fore and aft, and the bench-type front seat gives a very comfortable chair-type riding position. We might emphasize the comfort a bit by stating that at the time of the test one of us was developing a boil, and although he was sitting on it, pain was negative. Indeed, he forgot all about it. As on other Jaguar models, the steering wheel is adjustable to suit individual driver requirements. Visibility to the front is good, and to the sides is limited slightly by the side posts, although these are less disturbing than the distortion found in some wrap-around windshields. Vision out back via a small rear-view mirror is adequate although limited. A side-view mirror on the fender or door post would be welcome.

The accelerator location is excellent and comfortable. The brake pedal, wide enough for use by either foot, is just high enough to be a trifle awkward. Location of the gear selector is in a quadrant at the base of the dash panel, right in the center of the car, with the positions Park, Neutral, Drive, Low and Reverse from left to right. The handbrake is very convenient, alongside the seat at the driver's left. All essential instruments are present and welcome, as opposed to little warning lights for oil and battery. With the gauges spread out across the face of the dash panel, however, those on the right — oil pressure gauge, ammeter and speedometer, are not easily read.

Outward appearance of the 3.4 is similar to that of it's smaller-engined brother, the 2.4 sedan. On the 3.4, the fender skirts over the rear wheels are gone, and the radiator grille is slightly wider. The large rear deck opens wide to reveal a high, deep trunk compartment. Tool and spare tire storage is in a separate compartment below this. The bumpers, which wrap around both front and rear fenders, should hold their own in normal city bumps and grinds.

The hood opens easily by way of a knob under the dash panel, and opens wide enough to give fair access to engine and under-hood accessories, although things get sort of cramped toward the front, where the opening becomes quite narrow. The 210 cubic inch, six cylinder engine sits there looking ready for business, with the polished covers over the double overhead cams, and the twin S.U. carburetors. The air cleaner must be removed to give access to spark plugs.

In spite of Jaguar literature that states that the engine can be started with the selector on the Borg-Warner automatic box in Park or Neutral, this was not the case in the test car, which started easily with the lever in Park, and not at all with it in Neutral.

Furnished by Jaguar Cars North American Corp., our 3.4 started easily from cold, and warmed up quickly, giving a smooth idle at 500 rpm. With the gear selector in Drive, idle speed dropped to about 400 rpm. In a slow take-off, response to a slight pressure on the accelerator is instantaneous and smooth all the way up, with shifts from low to intermediate and from intermediate to high coming in at about 1800 rpm in each gear. When the accelerator is mashed to the floor there is only a slight hesitation before the action starts, com-

SCI ROAD TEST:

Jaguar 3.4 Sedan

Absence of rear fender skirt is mark that distinguishes the 3.4 from the 2.4 sedan.

Control lever for the automatic transmission is mounted in a quadrant at center of dash panel.

Engine compartment is far from roomy. Air cleaner must be removed for access to spark plugs.

Trunk compartment provides ample storage space. Spare tire and tools are below trunk floor.

Rear end tends to break loose early in a fast turn, but skid can be controlled with throttle.

pared to the "it's-winding-up-something-is-bound-to-happen-soon" feel of most automatics. With the gas pedal all the way down, the engine winds out to about 5000 rpm before each shift occurs – about 48 mph for the shift from low to intermediate, and about 78 mph for the shift into high.

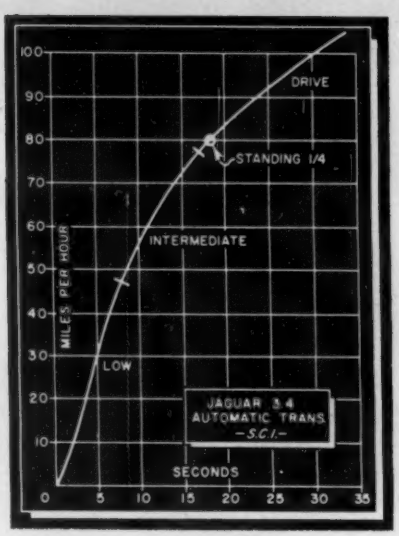
In making our acceleration runs, we held the car manually in the gears by starting with the selector in low, moving it to drive for the shift into intermediate, and back to low to hold the box in intermediate until we were ready to shift to high. Acceleration is potent all the way up; our 0-60 mph time was 11.4 seconds, and we went from 0-100 in just over 30 seconds. Incidentally, the speedometer error is almost negligible, the true speed throughout the entire range being just one mile per hour more than the indicated speed, except between 60 and 70 mph, where it was right on the button.

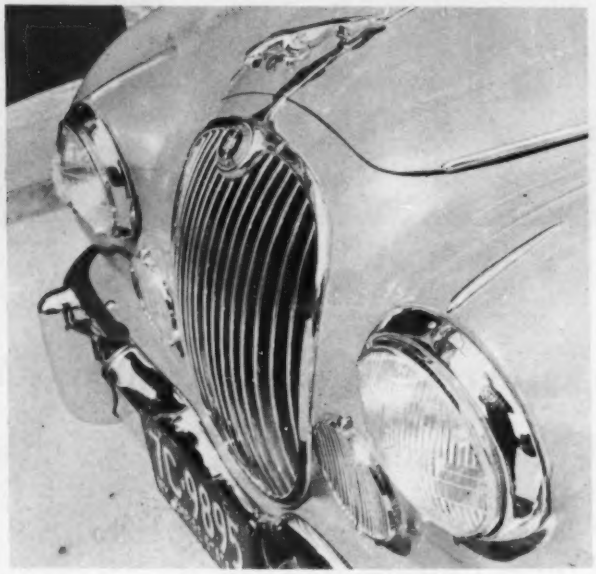
Our top speed runs were made with a strong crosswind prevailing; we could really feel the wind pressure and it took considerable control to keep the 3.4 on course. Our best run gave us 121 mph, with a speedometer reading of 120 at 5300 rpm. Our times were evidence that the engine was nicely broken in, with 1920 miles on the odometer at the start of the test runs.

Handling, as stated earlier, is generally good, although not in the sports car class. With slightly more than four turns of the steering wheel, lock to lock, getting around tight corners takes a bit of winding. Wheel return is strong, and is stiff at slow speeds. Although there is almost no play in the wheel, it has what can be best described as a "vague" feel in the dead-ahead position. It does give a good balance between road reaction and road feel, but at medium speeds over a washboard surface, it gave us the impression that something might be loose in the front suspension, especially as we were running tire pressure (35 psi) slightly higher than normal.

Going into a turn, a strong understeer characteristic becomes readily apparent, meaning that we had to keep turning tighter into the corner as we went around. Some lean is present and this is probably one of the reasons the rear end tends to break away early. This is not uncomfortable, as the resulting slide is easily controlled. Tire noise was present, even with the high pressures.

While Jaguar now offers disc brakes on a couple of its models, the XKSS and XK 150, the 3.4 still has standard drum-type brakes. These operate in 11⅛ inch drums, are servo-assisted and self-adjusting. They take hold smoothly with moderate pressure from normal cruising speeds, but a quick stop from high speeds brings a certain amount of shimmy. Brake fade, in our test, was quite rapid. As the test entails ten fast stops in succession from 60 mph, it produces





Front end is distinctively Jaguar style. Grille is slightly wider than that on 2.4 sedan.

strains and reactions that are not normally encountered — unless some maniac is making a speed run down a twisting mountain road, and, well that's just *one* less car and maniac on the highway. For normal driving, the 3.4's brakes are adequate and safe. In any case, recovery from fade after our test was complete and rapid.

An innovation which could well be picked up over here is the anti-creep device incorporated in the automatic transmission. When the car is brought to a dead stop, it stays there after the foot is removed from the brake pedal. A touch of the accelerator starts it moving. This can, in some cases, hinder low-speed maneuvering, but as it doesn't take hold until the car is at a complete standstill, and then only when the brake pedal has been mashed down firmly, it causes no real inconvenience.

Another feature of the Borg-Warner gearbox, as fitted to the Jaguar 3.4, is a little toggle switch mounted on the dash to the left of the steering wheel. When flipped, it keeps the gearbox from shifting into Drive range. This is supposed to be handy when driving along winding roads, preferably uphill as there is no engine braking through the transmission except in Low, and this comes in very distinctly at about 10 mph — just before the car stops completely when the brakes are applied.

(Continued on page 51)

JAGUAR 3.4 SEDAN
AUTOMATIC TRANSMISSION

PERFORMANCE

TOP SPEED:

Two-way average	118.5 mph
Fastest one-way run	121.0 mph

ACCELERATION:

From zero to	seconds
30 mph	5.0
40 mph	6.5
50 mph	8.8
60 mph	11.4
70 mph	14.3
80 mph	18.2
90 mph	24.0
100 mph	30.3
Standing ¼ mile	18.0
Speed at end of quarter	79.5 mph

SPEED RANGES IN GEARS:

Low	0-47 mph
Intermediate	0-77 mph
High	0-Top

SPEEDOMETER CORRECTION:

Indicated	Actual
30	30
40	41
50	51
60	60
70	70
80	81
90	91
100	101

FUEL CONSUMPTION:

Hard driving	17.2 mpg
Average driving	20.5 mpg

BRAKING EFFICIENCY:

(10 successive emergency stops from 60 mph, just short of locking wheels):

1st stop	68
2nd	68
3rd	60
4th	55
5th	54
6th	49
7th	45
8th	45
9th	45
10th	45

SPECIFICATIONS

POWER UNIT:

Type	In-line Six
Valve Arrangement	Double OHC
Bore & Stroke	3.27 x 4.17 ins. (83 x 106mm)
Stroke/Bore Ratio	1.28/1
Displacement	210 cu. ins. (3442 cc)
Compression Ratio	8/1 (7/1 optional)
Carburetion by	Two S.U. H.D. 6
Max. bhp @ rpm	210 @ 5500
Max. Torque @ rpm	215lbs.ft @ 3000
Idle Speed	500 rpm

DRIVE TRAIN:

Transmission ratios:	
Low	2.30 to 4.98
Intermediate	1.50 to 3.25
High	1.00
Final drive ratio (test car)	3.54/1
Final drive ratio in O.D. equipped cars	3.77/1 (2.93/1 in O.D.)
Axle torque taken by	Radius arms and springs

CHASSIS:

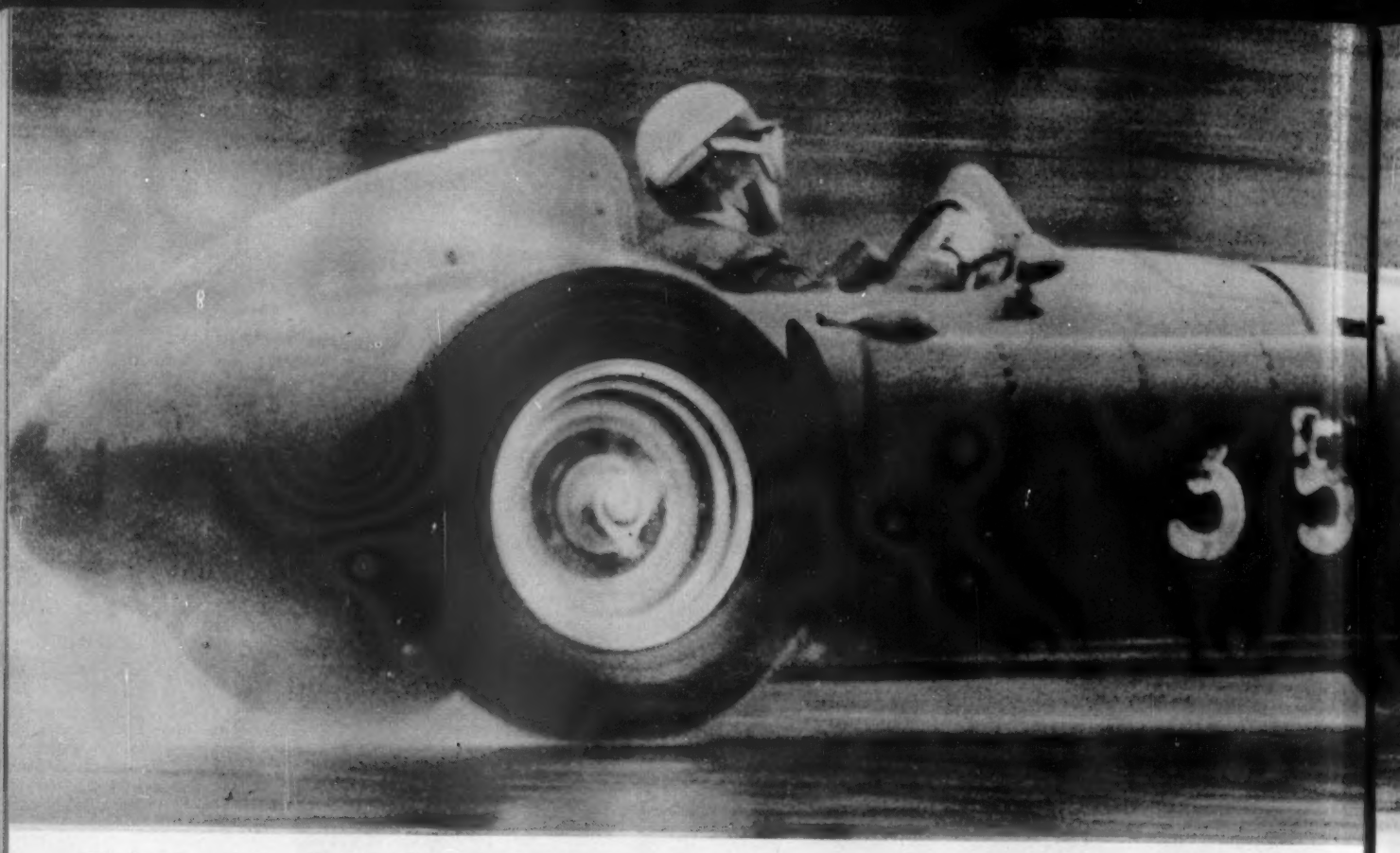
Wheelbase	107.4 ins.
Front Tread	54.7 ins.
Rear Tread	50.5 ins.
Suspension, front	Coil and wishbone
Suspension, rear	Quarter-elliptic leaf springs
Shock absorbers	Telescopic
Steering type	Burman recirculating ball
Steering wheel turns L to L	4¼
Turning diameter	34.75 ft.
Brake type	Lockheed, vacuum servo, self-adj.
Brake lining area	157 sq. ins.
Tire size	6.40 x 15

GENERAL:

Length	182 ins.
Width	66 ins.
Height	56 ins.
Weight, test car	3180 lbs.
Weight distribution, F/R	57.8/42.2
Weight distribution, F/R, with driver	58.3/41.7
Fuel capacity—U.S. gallons	15

RATING FACTORS:

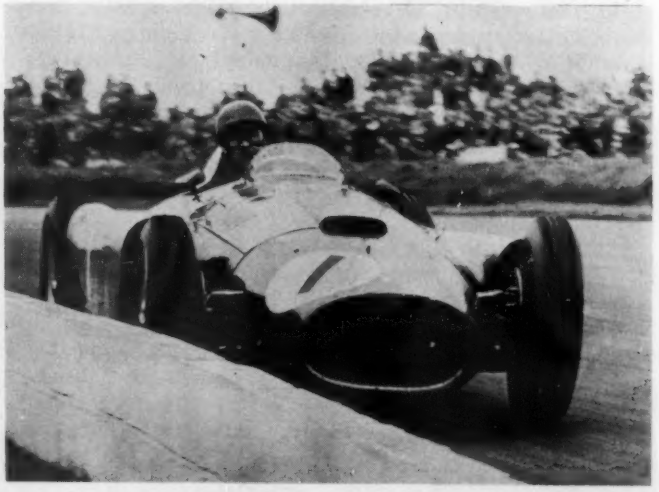
Bhp per cu. in.	1.00
Bhp per sq. in. piston area	4.18
Torque (lb-ft) per cu. in.	1.02
Pounds per bhp—test car	15.1
Piston speed @ 60 mph	1925 fpm
Piston speed @ max bhp	3280 fpm
Brake lining area per ton (test car)	99 sq. in.
Mph in drive range at 1000 rpm	21.6

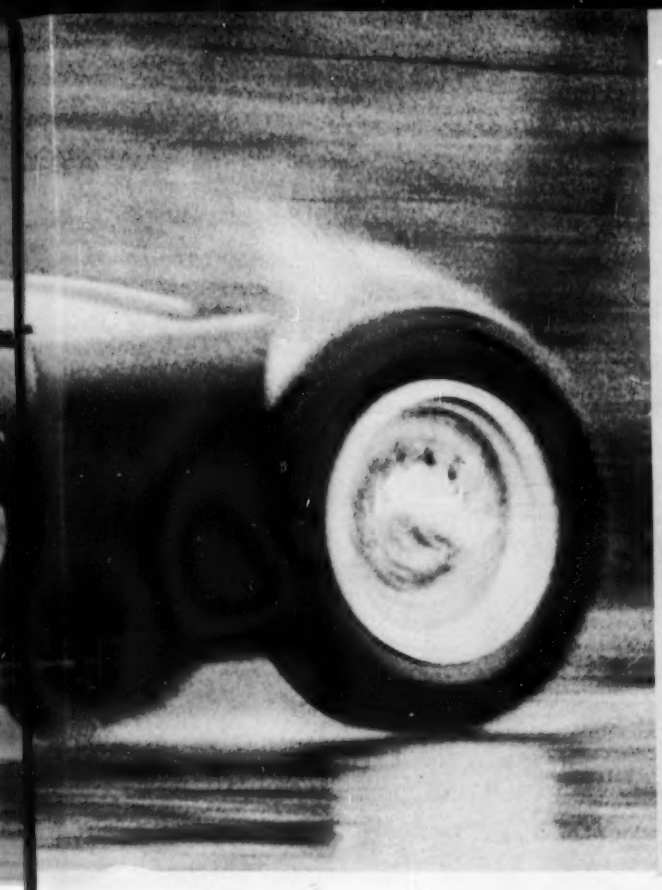


The late Eugenio Castellotti, Belgian Grand Prix, 1955

SCI Technical Report:

CONSISTENT CHAMPION





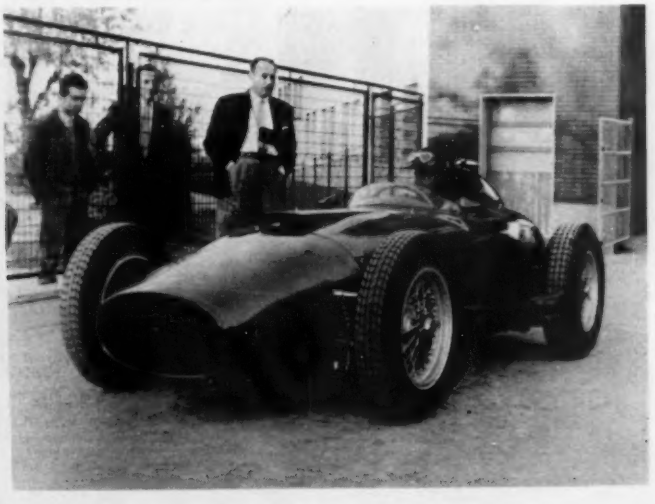
IT WAS Vincenzo Lancia, a glowing, hulking mountain of a man who once roared, between sea-draining swigs of champagne, "To WIN a race you must FIRST stay on the ROAD!" Never daunted and full of cheer, he tested all inferences of this remark, wreaking his ebullient spirit on the then-new F.I.A.T. racing cars — awful monsters of machines to ordinary men but pitiful toys in the vast palms of Vincenzo. To vent his horizonless energy, Lancia turned to the building of cars that could take it, cars that leaped to being under the spurs of his imagination. They climbed fast and hard to the ever-rising plateaus of automotive design and beat many new paths of their own, but never did the firm at 27 via Vincenzo Lancia, Torino, release its creations for racing.

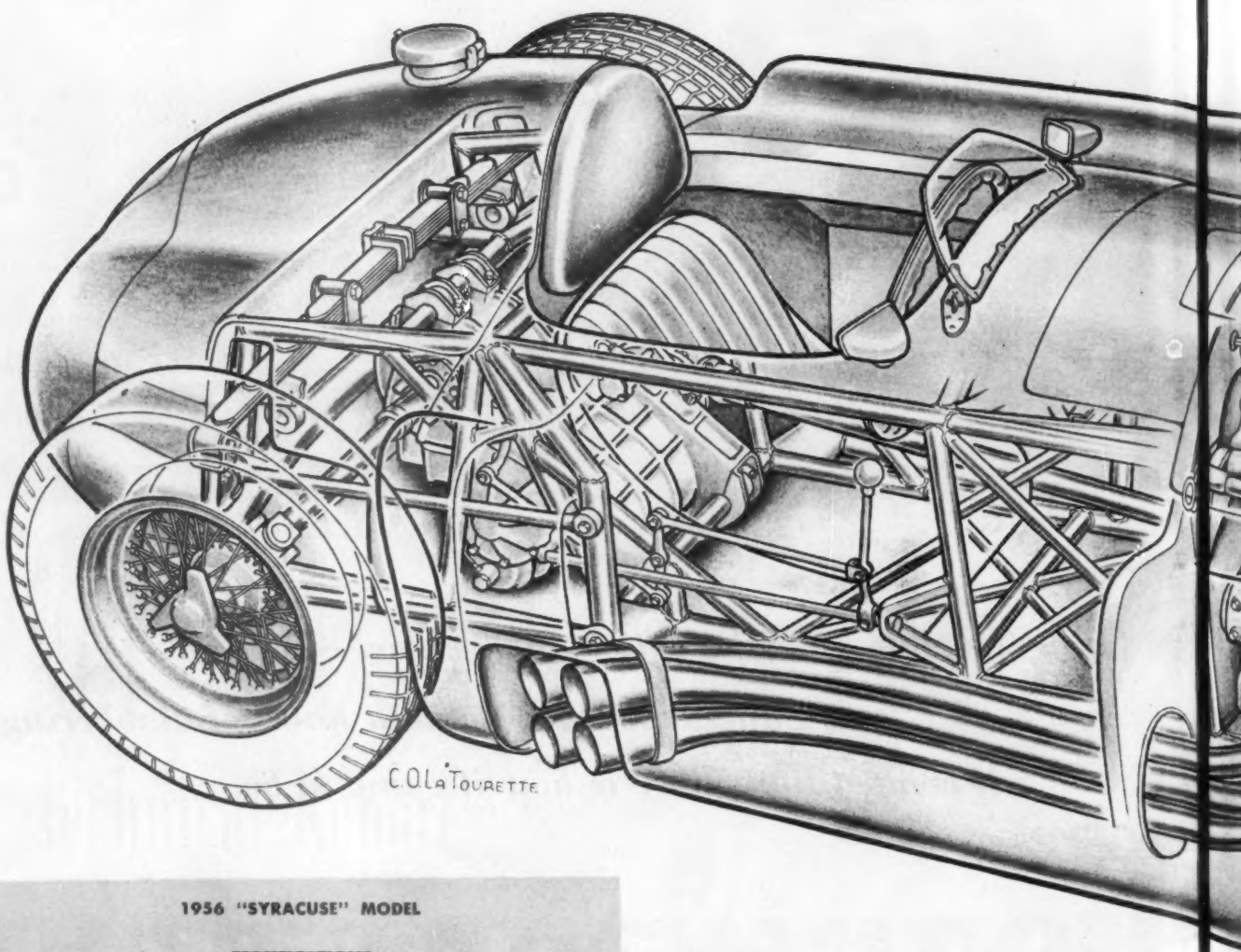
Never, that is, until heir Giovanni, like his father in bulk alone, emerged from engineering school and found Lancia & C. and its tradition in his hands. There was another asset: Vittorio Jano. This facile mind had been at work for Fiat during the decade before 1921 and developed the P2 machine with which Alfa won the '24 French Grand Prix. It streaked on to design the classic yet radical Type B "P3" Alfa Romeo of 1932 and the other Alfas of that time on which Nuvolari worked some of his greatest wonders. In 1938 Jano joined Lancia, and after the war he presented the company with the imperturbable Aurelia model.

Hiding below broad brims and dark glasses, the near-sixty Vittorio was thin to the point of gauntness and fairly vanished next to "Gianni" Lancia, with whom he worked to design the Jewel-like Appia of 1953. These two conspirators, betrayed by their past, had more on their minds than pro-

From the time of its inception the Ferrari— nee-Lancia D50 has made a habit of clobbering all competition. Here is how it came to be.

Handling characteristics of the prototype D50, FAR LEFT, were designed for skill and ability of Ascari, whose untimely death precipitated the cars' transfer to Ferrari and their subsequent chassis-detuning. Fangio, LEFT, proves that GP cars DO roll at Silverstone in 1956. At Monza, BELOW, Collins tests the early 1957 model which has already been superseded by latest car, RIGHT, which uses coils in front and has abandoned the famous, but now empty pontoons.





1956 "SYRACUSE" MODEL

SPECIFICATIONS

POWER UNIT:

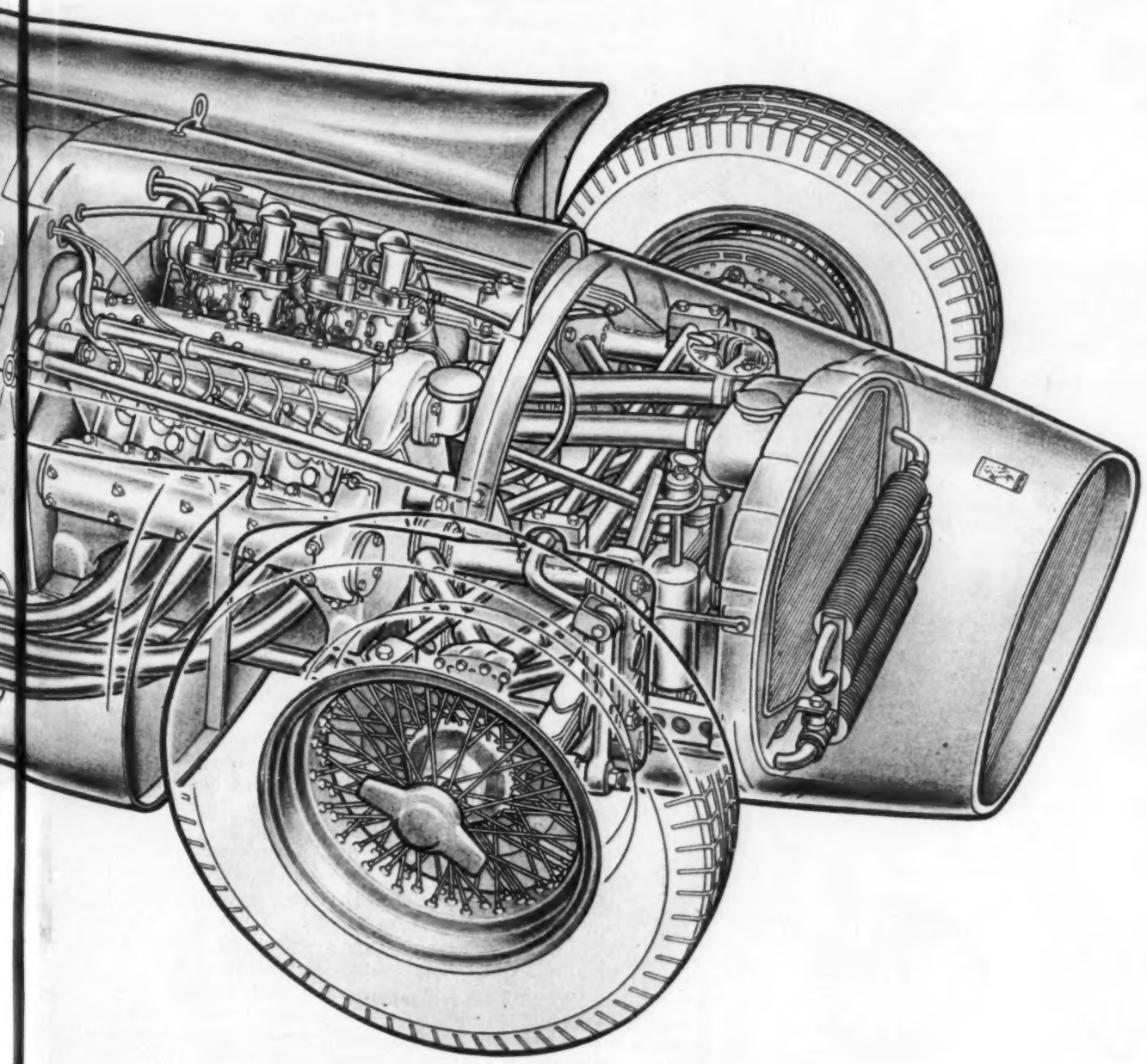
Type	V-8, 90°
Valve Arrangement	Inclined 40°
Valve drive	Four chain-driven camshafts
Bore & Stroke	2.99 x 2.70 in. (76 x 68.5 mm)
Stroke/Bore Ratio	0.90/1
Displacement	151 cu. in. (2490 cc.)
Compression Ratio	12/1
Ignition by	Two Marelli magnetos, two plugs per cylinder
Carburetion by	Four Solex 40 PII
Max. bhp @ rpm	275 @ 8000
Bhp per cu. in.	1.82
Bhp per sq. in. piston area	4.92
Piston speed @ max bhp	3600 fpm

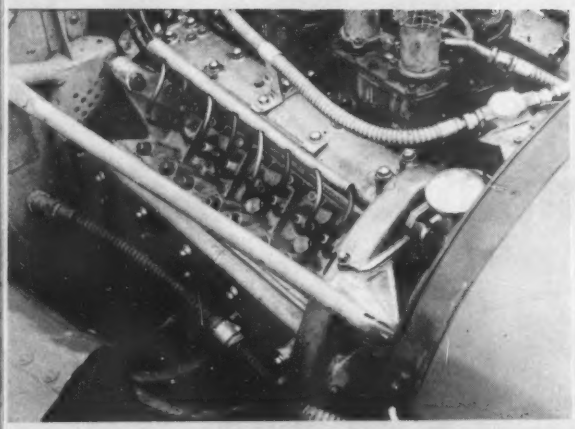
CHASSIS:

Wheelbase	90 in.
Front Tread	50 in.
Rear Tread	50 in.
Suspension, front	Equal length wishbones with ball-joints, tranverse leaf spring, anti-roll bar
Suspension, rear	de Dion axle, parallel radius rods, sliding guide, tranverse leaf spring
Shock absorbers	Front: telescopic, rear: Houdaille rotary
Frame construction	Space frame of small diameter tubes
Drive train	Clutch and differential in unit with 5 speed and reverse transmission
Brake type	Drum type, two leading shoe
Tire size	front: 5.50 x 16, rear: 7.00 x 16
Fuel capacity	61 U. S. gallons

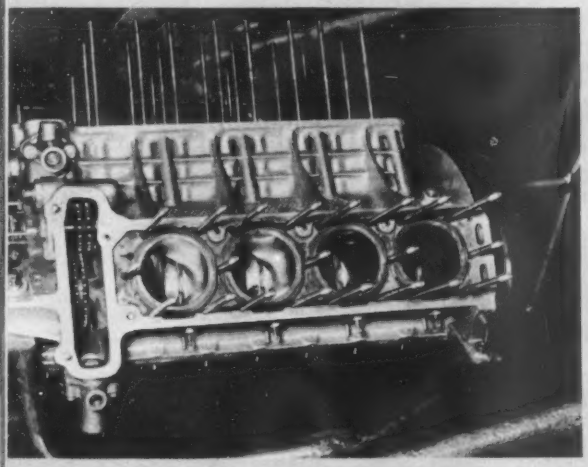
FERRARI LANCIA D-50

Starting Point for Championship

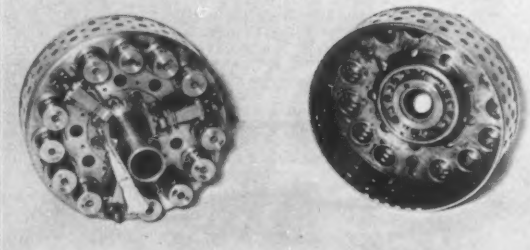




The sturdy, well-ribbed cylinder heads, with built-in lugs, served as frame members in the original Lancia concept. Ferrari's first step was to relieve them of chassis loads by adding struts.



Bristling with studs, and with crankshaft and cylinder liners already installed, this crankcase is now ready to receive the diagonally split con-rods and the five-ring pistons.



Not bank vault doors, but two views of part of the multi-plate clutch, with the task of containing torque and plenty of it.

duction profits, to the glory of racing car design and the grief of the stockholders (among whom the Lancia family were most numerous). In 1952 it was generally surmised that the Lancia factory would be in racing with both feet soon, after the Gran Turismo Aurelia had done some astonishing things at Le Mans and Mexico.

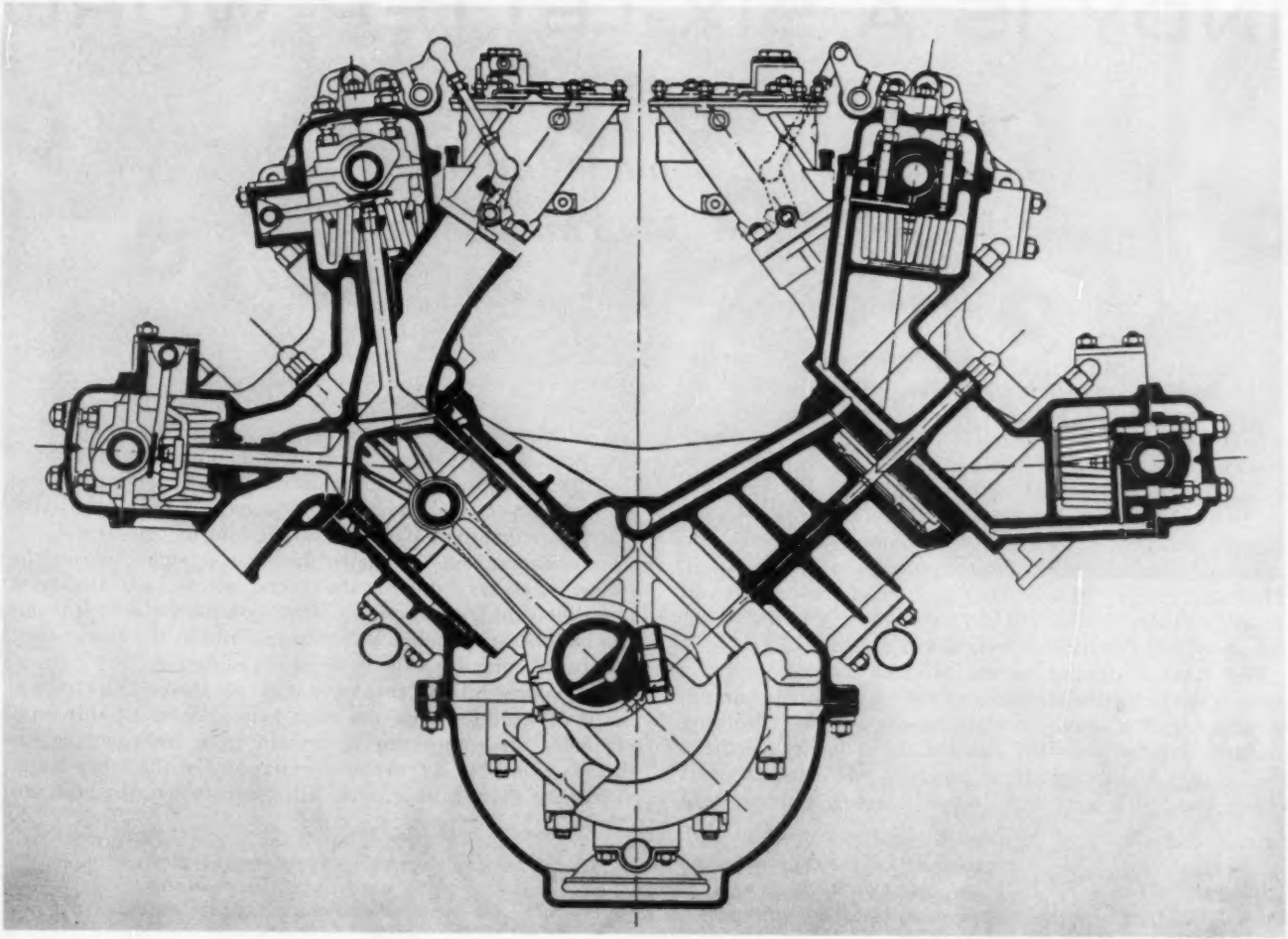
As finally settled, the Jano-Lancia Postwar Plan was very similar to that adopted by Mercedes. A year or two of sports car racing just to get the feel of things and build up a cohesive *scuderia*, and then the Grand Prix effort, but only when really ready. First manifestation of this came on March 15, 1953 when the Le Mans entry list was seen to include three 2.9 liter Lancias. Just like the 300SL the year before and the SLR two years later, the new machines were first revealed for the Mille Miglia. They resembled the Aurelias in that they were coupes (fashionable at the time) with vee-six engines in front and a combined clutch-gearbox-differential in the rear, but that's about as far as it went. The V6 had two plugs per cylinder and inclined valves with twin overhead cams. Jano shook the sports car world in 1935 when he designed a twin-cam 2.3 liter Alfa with chain drive to the cams, and the new Lancias had the same logical, cheap feature.

Displacement was 2,962 cc (86 x 85mm) and was fed by three twin-throat Webers ducted to ports on the inside of the 60 degree vee. A reasonable estimate of power at this time might be 210 bhp at 6700 rpm, though reports then ranged from 120 to 240 horses for this mystical machine. The Lancia crew weren't loose-lipped about it either. Final drive was as mentioned, with the three units right in line. Rear suspension was similar to that of the then-current Aurelia, with angled trailing arms, but had a transverse leaf instead of coils. The greatest standing Lancia tradition — sliding pillar and coil spring front suspension — was set down by a system of parallel trailing arms like that on the Aston DB3, mounted on a big tube crossmember and shackled to another transverse leaf. Telescopic shocks were used all around, and the whole works was united by a triangulated frame of small tubes.

Most radical were the brakes, which were all about half a foot wide and all bolted firmly to the chassis, as sprung weight. This was then common at the rear but unheard of at the front, where the drums were placed either side of the radiator and connected to the wheels by U-jointed shafts. To gain "leverage" and improve cooling and control each drum was fitted with a small planetary gear to whirl the drum faster than the wheel. The coupes were stubby, rugged-looking weapons in their scooped and vented blue-and-white Farina bodywork. They went, too, taking third in their maiden race and winning the Targa Florio three weeks later.

For Le Mans they clamped on a moderate-boost Roots blower which nestled in the crotch of the vee. It was fed by two horizontal Webers and driven by a three-inch-wide flat belt at the rear. Engine size was cut to 2.6 liters to help out on handicap, and the resulting assembly just couldn't push the 1870 pound coupe very fast. They all broke down.

Lancia now had an impressive racing organization that was rolling fast and didn't make the same mistake twice. Just a fortnight after Le Mans they had a bright red open two-seater version running at Monza, where the late Felice Bonetto used it to snag second place. This was a lighter short-chassis rig with the 2.9 engine but with revised rear suspension. The cross spring was still there but now hooked to a de Dion tube curving behind the differential. Location was by a central sliding guide and parallel radius rods at each hub. Bonetto went on to win the Portuguese G.P. with this car, then joined the rest of the team at the Nürburgring for a big test session, in the course of which a few unofficial distance records were wiped out.



An extremely handsome layout, the four-cam 90° V-8 has shown impressive improvement in Ferrari's hands. While the special Weber carbs and even the bore and stroke have been changed again and again, basic features, such as the rigid crankcase structure and the drilled oilways, have proved their value throughout the long period of development.

For the 1000 kilometer race at the 'Ring at the end of August, Lancia turned out yet another version, named the Type B24. This was the basis for all their sports car work from then on, having a 3.3 liter engine and a new gearbox in which the four speeds were slung below the differential instead of in line with it. The de Dion tube now bent around in front of the final drive and was located by a trailing quarter-elliptic spring and radius rod at each side – lighter and more compact than the previous version.

This at last was the race car Gianni and Jano were after. With Fangio on the team the two new cars had no trouble leading a 4.5 Ferrari until they were both disqualified by battery failure. They were fast enough to give confidence, though, and to be on the safe side for the Carrera Mexico engine size was cut to 3.1 liters with one even three liter car for Castellotti. These swept Lancia to its first big-time win, running easily to the first three places. Engineer Piero Taruffi (second place) had high praise for the cars: "They needed little overnight servicing and had the same compression and valve clearance as when we started!"

Once the sports car was set, in September of 1953, construction of a Grand Prix car prototype moved into top cog. Vittorio Jano was no longer young, and realized that this was in all likelihood his last great project. He had always known that high power was no substitute for light weight and good handling – proven in the Alfa days – and had learned a lot from the Lancia sports machines about highly developed modern suspension techniques. Over his head was the threat of Mercedes, too, for Jano knew that Uhlenhaut held a strong lead in facilities and that most valuable commodity, time. The new Lancia would have to be light, simple and compact to a degree never approached before. They would have to build close to a dozen of them. And they would have to be handled by the best racing drivers in Italy.

There was cloudless sun but it was sweater-cool over the concrete of a private circuit near Turin. It was early January, and mechanics who had not been told that it was now 1954 stood with weary, flickering smiles as Alberto Ascari approached, loosely swinging his eggshell blue crash hat. Looking on, young Lancia knew he had his team. Soon – they didn't know when – he and Jano would know if they had a race car in the squat, dark machine that waited muttering on the concrete.

(Continued on page 54)

INDY IS A SIX-LETTER WORD

That word still spells torque but it was a seven-letter word that made the big difference in '57. This one says "chassis".

By GEORGE MOORE

INDIANAPOLIS is a six letter word spelled torque. Whether or not it is justifiable to call the place the world's greatest race course is a matter of personal opinion. But one thing is not to be denied, it develops a particular breed of men and machines which for this type racing has no peer anywhere in the world.

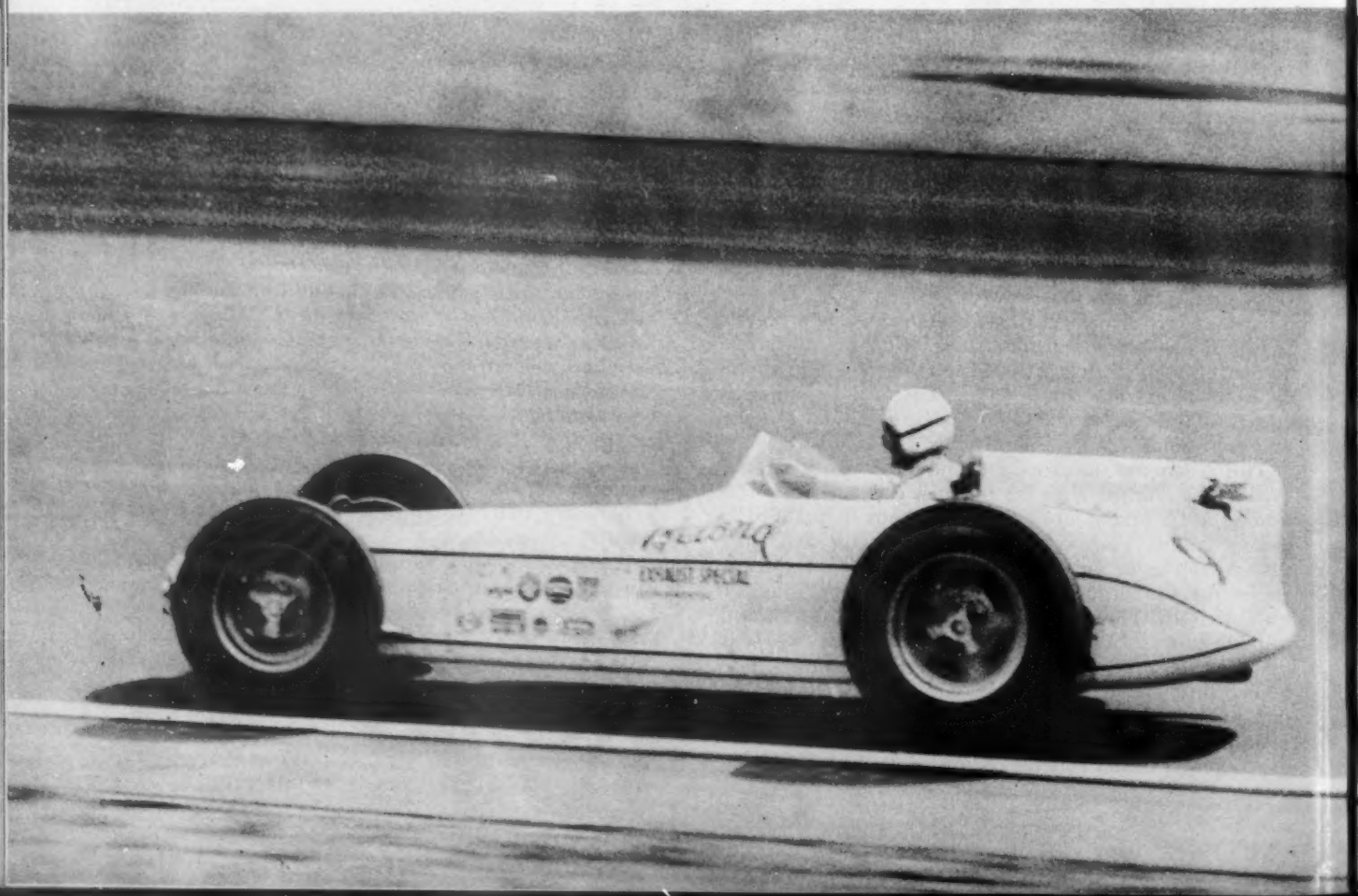
The 1957 500-Mile Race developed a number of interesting paradoxes concerning the construction of race cars, and tore to shreds the myth of the invincibility of the Novis. The basic theory, "If you don't get out of the corners and across the short chutes, you ain't going," still is the standard governing the Indianapolis Motor Speedway.

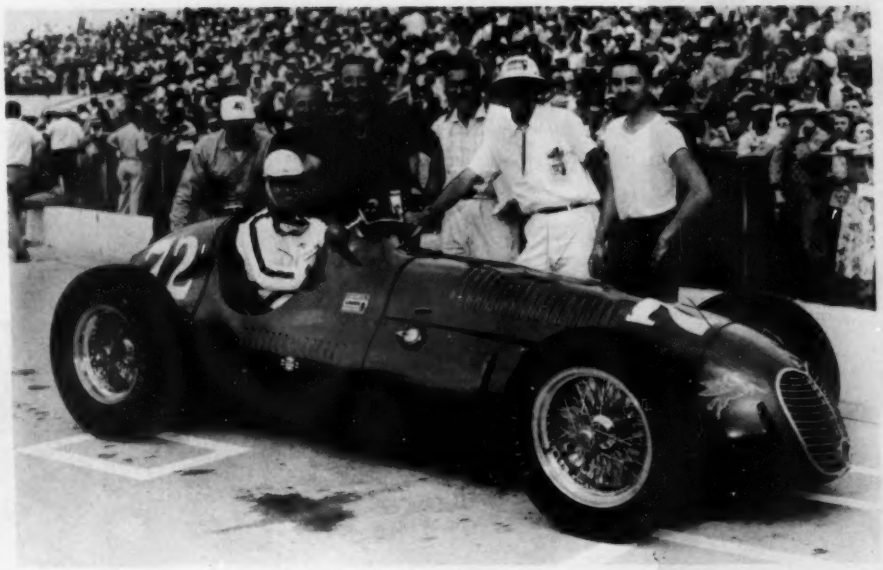
The layman coming to the Hoosier capitol generally harbors the delightful delusion all that is needed is bundles of power and a strong boy to do the steering. Nothing could be farther from the truth. Lots of horses can be a good thing. At the Speedway, however, you need the oats where you can't get them, namely going through and coming out of the turns. Nobody develops more power than the Novis, yet Sam Hanks' Meyer-Drake blew them off while everybody still was fresh and eager to go.

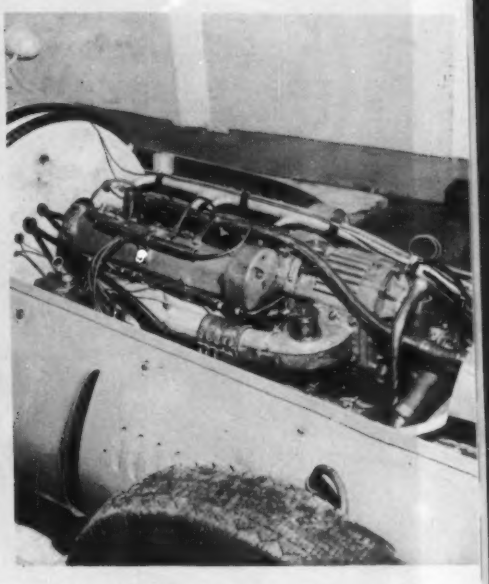
What really is wrong is when the chauffeur backs off to get into the corner, the "revs" drop, and so does the speed of the impeller in the centrifugal blower. The result is — no impeller speed, no pressure, no power. By the time engine and impeller speeds are high enough to do some good, the car is almost half way down the main straights. Across the short stretches between the turns, all is lost. During a qualification trial when the blown job is all alone, it is not so bad, because the driver can take a run at the corner. But in traffic, the situation is decidedly different.

In taking up the case of the Meyer-Drake Offenhauser, it is difficult for even the most avid admirer of this four-cylinder air compressor to refrain from interspersing his admiration with a few choice epitaphs. On the other hand, even the most caustic critic will admit when you lean on

Sam Hanks is completely at ease while taking the Belond Exhaust Special around the southwest corner at better than 130 mph. Engine is mounted almost flat on its side; top of hood is only 19 inches from ground. Hanks started from 13th position, took lead early in 24th lap, and went on to win easily with a record average of 135.601 mph.

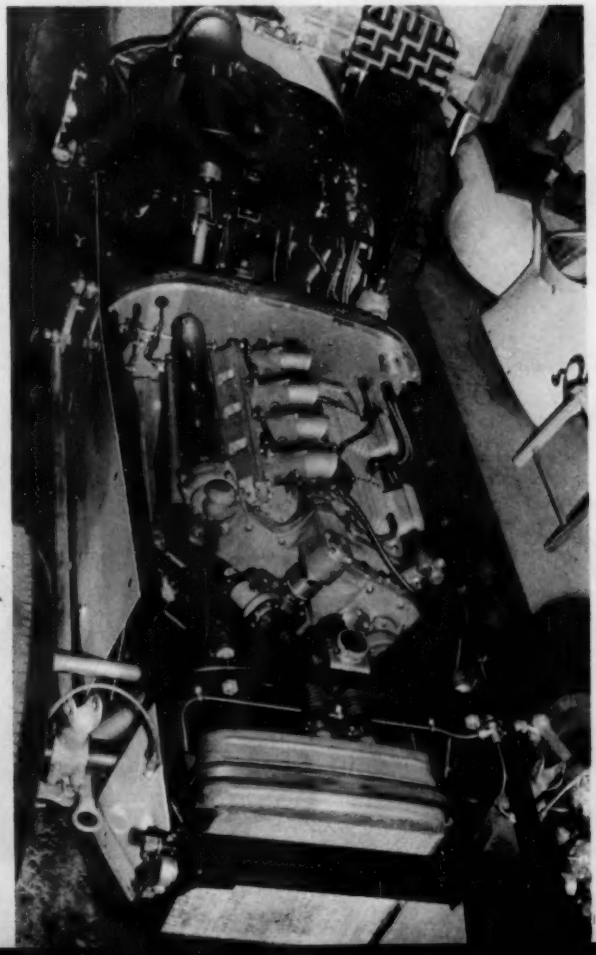






Maserati pit crew with driver Danny Kaldis and owner Bob Morgan (dark shirt) after qualifying the 4 CLT Maser. The 93 inch engine is supercharged by a two-stage Roots blower, and runs on a mixture of benzine and alcohol.

George Salih placed the Belond Offy's crankshaft, driveshaft and CG to left of the center line. Seat, placed to right was spacious, and gave comfortable ride.



the button, the old four-banger goes "chuffa-chuffa-chuffa" and you strictly are on your way. A well set-up Offy will leap off the corners to cut down those all-important seconds so necessary for quick lap times.

This hunk of cast iron is the offspring of the design precepts administered by the late Harry Miller. Miller's early day engines were eight-cylinder affairs, but they still were built around the integral head and block, double overhead cams, barrel-type crankcase that has been carried forward to the present time.

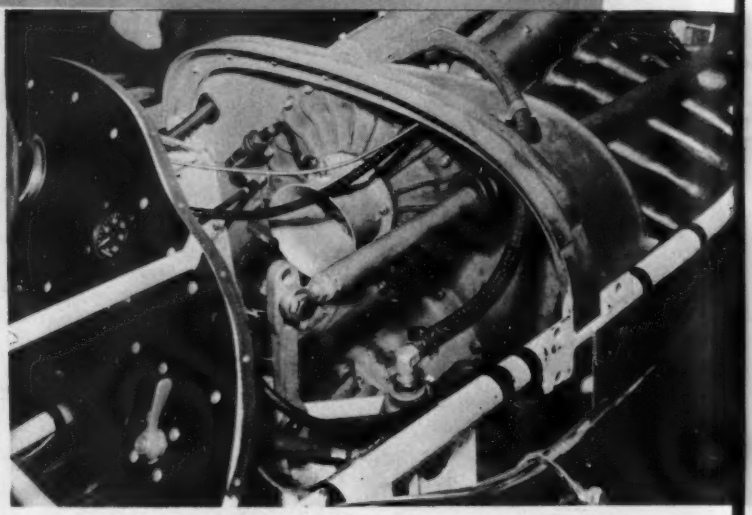
Naturally, refinements have been evolved and modern metallurgy permits limits of stress not possible 30 years ago. But the fundamentals have remained the same, almost to the extent of standardizing a power output of something over one horsepower per cubic inch unsupercharged, as against three horsepower for the blown engine.

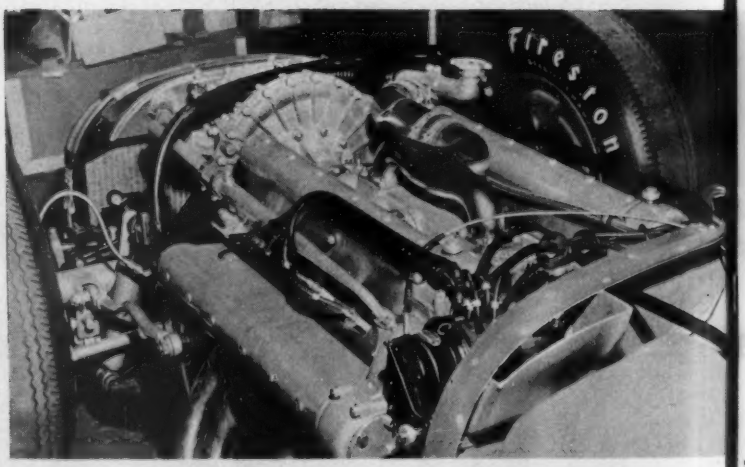
When George Salih, builder of Hanks' winning car, began to construct a new machine, he began sawing away on some more or less radical ideas which had been running around in his head. He tried interesting wealthy car owners in building an automobile departing from accepted standards, explaining he did not intend to wander so far afield he would be beating the bushes of unexplored territory. When nobody came forward, he undertook the project on his own hook, purchased the engine outright, and floated a loan for financing the remaining portion of the machine.

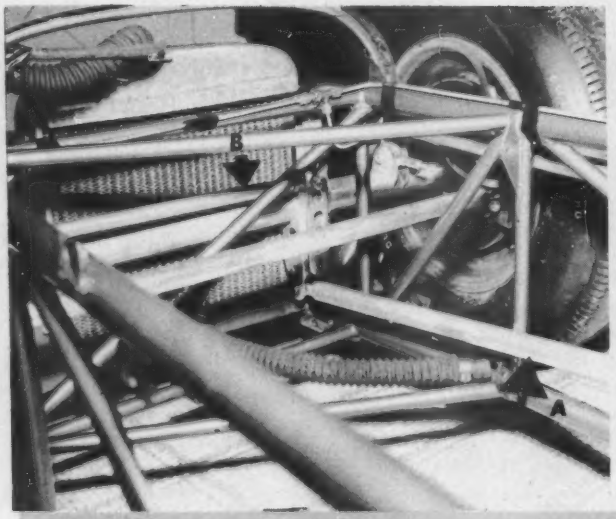
By now, the whole world knows Hanks drove a car with the engine laying on its side. Basically, all that was necessary after laying over the powerplant was to make some changes in the bottom of the crankcase by building an additional pan from which the sump pump could pick up the oil. During practice, blowby was experienced due to oil failing to return to the pan, and the entire crew disappeared behind locked doors to analyze the trouble. The "Open Sesame" was found in a second oil pump driven from the nose of the low positioned exhaust cam to carry off oil collecting in the cam housing troughs.

The chassis department was where the owner-builder really foxed them. He took his experienced hand to the welding torch and fabricated his own. This move, by the way, reveals

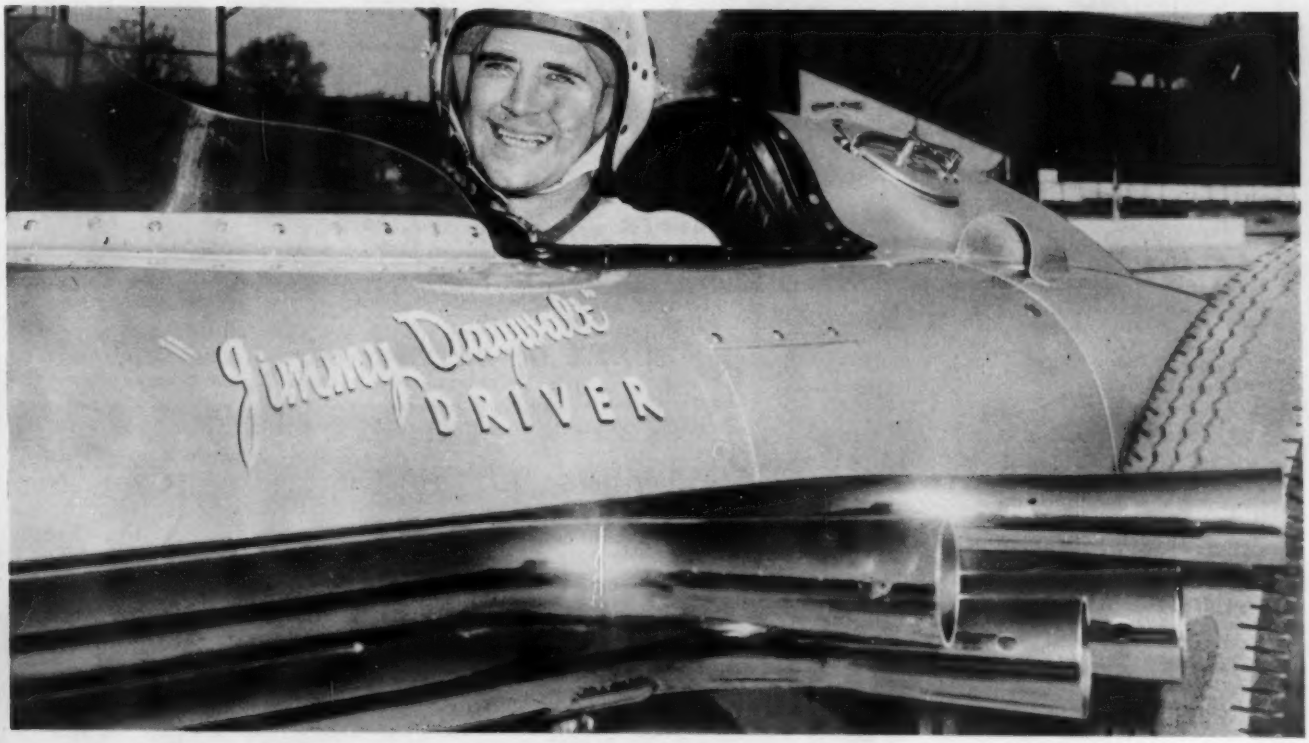
LEFT: Supercharged Meyer-Drake in Wolcott Special is angled 13° from centerline of chassis. TOP RIGHT: Blower intake has a single injector nozzle that dribbles fuel into the air stream to reduce the air temperature. CENTER RIGHT: Centrifugally-blown Novi V-8, like its half-size cousin, the 1.5 litre BRM V-16, lacks torque in the lower speed ranges. However Russo set qualifying one-lap record of 145.255.







ABOVE: Chiropractic Special was runner up. Here, lengthening the radius rod (A) will increase the castor angle, while raising the Panhard rod (B) raises the roll center. RIGHT: Tail piece, protected from rear contact by a bumper bar, also serves as the fuel tank.



Helse Special set off a month-long controversy with its tuned-length exhaust stacks. Old rules stated that for safety, pipes had to extend past the driver; however rules were modified and the pipes remained.

another interesting fact in that the best Kurtis-Kraft showing was a fourth place. However, all the chassis followed the basic principals laid down by Kurtis, with transverse torsion bars mounted ahead of the front axles and behind the rear.

Salih employed 1½-inch chrome moly for his main tubing and used a 1-inch size for brace. He also made his own front axle, but turned over the 63-gallon fuel tank, 10-gallon oil tank, and body work to a coming Californian named Quinn Epperly. The finished product stood 19 inches high at the front of the hood and 29 inches at the head rest. The operation was on the right track, for the job had a lower center of gravity, making it handle like a dream. Hanks reported the car felt almost like a midget. There did not seem to be any front or rear. It just was a matter of pointing it down and going around the turns in complete command of the automobile.

The second place man, Jim Rathmann, put in his appearance along about the half way point, leading the go from the 275-mile mark up past 325 miles. In the latter stages, both first and second place cars were on the same straightaway, with Rathmann's crew hanging out the charge sign. They kept getting the sign right back that the front end was pushing, so nothing was to be done about Mr. Hanks and company.

The Belond Exhaust Spl., that established the pace, and the Chiropractic Spl., snagging off the runner-up spot, had an affinity for one another inasmuch as Epperly created the second car in its entirety. Known as a "lighty," the automobile weighed but 1600 pounds dry, being fabricated from some of the lightest aluminum sheet metal and smallest tubing ever tried on a championship race car.

At the beginning, Epperly drew up some plans for the frame, having an engineer run a stress analysis to reveal any weak spots. The main tubing was 1½-inch .065-wall thickness joined to ⅞-inch brace of the same wall diameter. An aluminum fuel tank was constructed, with the unique innovation the fuel tank and tail were all the same unit. There was no outer skin to cover the tank. Protection was provided via a bumper bar similar to those found on a midget.

The suspension angle was built around the conventional torsion bar layout commonly associated with a roadster. The builder got off the beaten path, though, with a little ingenuity of his own, by creating a special front sway bar which could be raised or lowered in a lattice-work-like frame brace to permit the front roll center to be changed. This application never was fully developed due to a shortage of time, but the entire crew got along with the idea and seemed to think it will have some merit in the future. The track and chassis constantly change during a long race, so any compensation possible should give a driver just that much of an edge.

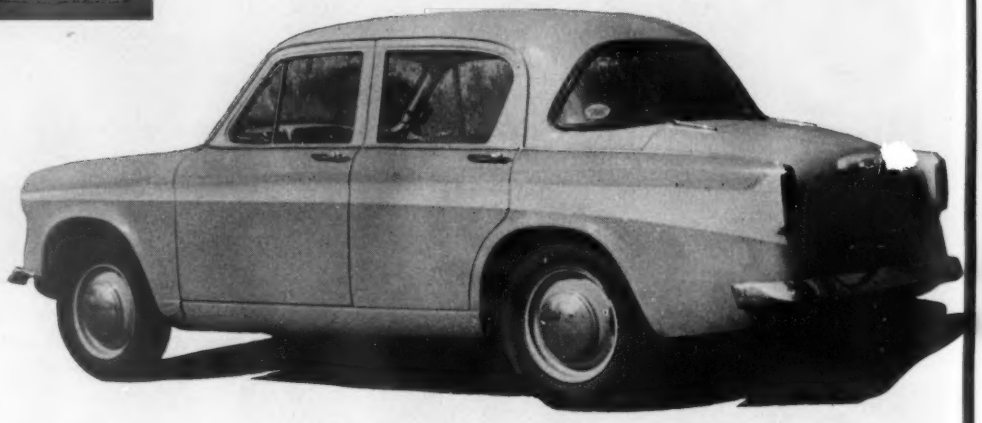
The new look at the Speedway took shape in various forms. Mostly, it was the product of the new Kurtis 500-G2, which was more narrow and a bit lower. Partially, it was achieved by moving the outrigger oil tank under the hood. A couple of teams that tried this move didn't like the results and made a last minute change to hang the reservoir back outside.

One of the proponents of making them long and narrow brought this end about by chopping seven inches out of the middle of their old car. The Dean Van Lines Spl., piloted by Jimmy Bryan, originally was built by Eddie Kuzma for the 1956 grind. Rather than build a completely new car, Clint Brawner, the chief mechanic, hauled it back to Kuzma's shop to whack a section out of the center and came up with the third place finisher which ran with the best of them. Kuzma also put his magic torch to the Greenman-Casale Spl., which was running well until Johnny Tolan made the only recent pit stop on record of facing North on a South bound track.

(Continued on page 57)

ALEXANDER'S MUSCULAR MINX

If someone with a Hillman leaves you standing, don't be surprized.



On tight turns, Alexander Minx rolls appreciably, but doesn't affect built-in understeer. Contrasting stripe on body flank is an Alexander touch to Minxes.

PROVERBIALLY, live horses are more responsive to a flogging than dead ones, so the compliment is unmistakable when the proprietary power packers pick upon a particular stock engine for their invigorating measures. Prominent among English apostles of hop, the Alexander Engineering Co. Ltd., of Haddenham, Buckinghamshire, has, by this token, paid the current Hillman Minx a tribute by giving it a liberal shot in the head. A Minx sedan embodying Alexander's engine conversion—plus certain transmission adjuncts and styling treatments that will be detailed as our tale unfolds—was recently submitted for an SCI road test, and with impressive results.

Point of departure for this Haddenham exercise is the 85 cubic-inch four cylinder engine that the Rootes Group has standardized on two out of three of their light cars—the Minx by Hillman and Rapier by Sunbeam. It has in-line overhead valves with pushrod and rocker operation, an equal bore and stroke of three inches, a three-bearing crank and an iron block and head. The everyday Minx uses a single downdraft Zenith carburetor and, with compression ratios varying from 7 to 8 to 1, develop between 47 and 52.5 gross bhp. The Sunbeam, which SCI has already tested, sports dual downdraft Zeniths and produces 67 bhp at 5400 rpm. Comparing stock with stock, therefore, the Rapier has a 27.6 percent advantage in output and goes roughly four mph faster than its kin. Also, to assuage the egos of Rapier owners who perhaps don't get many opportunities of demonstrating their superior performance to neighboring Joneses with Minxes, the 'Beam is endowed with handsomer looks and better finish and furnishings. Accordingly, its price at the factory exit, with no account taken of the various taxes or duties, is around 31 percent higher than the Hillman's.

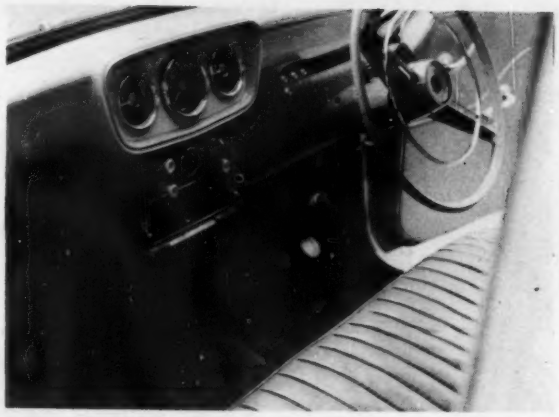
All the ports, intake and exhaust both, being separate in the basic Rootes design, the Alexander makeover retains the original cylinder head, but this is modified to raise the compression to 8.6 to 1. The combustion chambers, of offset bathtub shape, are carefully polished, the inlet and exhaust passages being enlarged and smoothed. The Zenith carburetor is replaced by twin semidowndraft SUs of 1¼-inch caliber, mounted on special manifolds sloped at 20 degrees to the horizontal and connected by a balance pipe. The regular exhaust manifold, which, contrary to Alexander's assurances, looks a bit of an impediment to free breathing, stays. So do the standard valves and springs.

The dual carbs with their individual air cleaners encroach on space normally occupied by the battery, which is therefore shifted to a corner in the trunk alongside the spare wheel. There it enjoys a cooler climate and must help, albeit fractionally, to redress the Hillman's prow-heavy weight bias, of which more later.

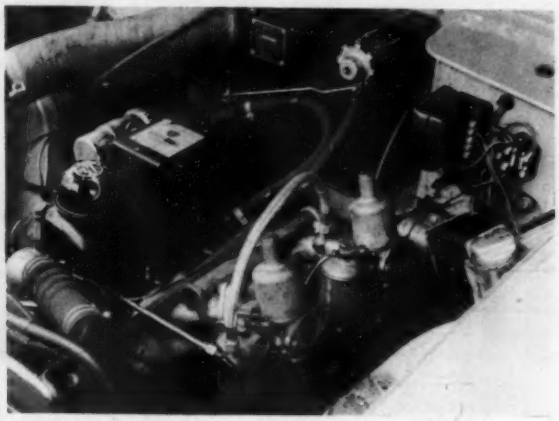
The combined effect of these measures is to up the output from the stock Minx figure of 52½ bhp to an even 70 at 5200 revs—a gain of no less than 33⅓ percent. This bonus thus costs 600 rpm, and only time will tell, of course, how the additional stressing affects general engine longevity.

In his Rapier road test (SCI's March issue) Karl Ludvigsen wrote that "the performance is up to sports car standards for a 1400 cc machine". From this it follows that the Alexander Minx must be above the sports car average for its capacity, because it beats the Rapier both in top speed and acceleration, the former narrowly and the latter by a progressive heap. At the risk of this report developing into a catalog of comparisons, here are some relevant abstracts from the two sets of performance data:

	Alex Minx	*Rapier*
Max. speed	85 mph	84.8



To round off the conversion, a floor shift can replace the shift on the steering column; however it is not a regular item of Alexander conversion.



Twin semi-downdraft SU carbs with 1.25-inch throats (air cleaners removed for clarity) are mounted on special manifolds sloped 20° to horizontal, connected by balance pipe.

Stg ¼	20.8 sec.	21.0
0-40	7.6	8.6
0-50	10.8	12.7
0-60	15.1	19.0
0-70	21.9	27.1

Alexander claims for the hopped-up Hillman a top speed of 90 under neutral conditions, but as our performance table shows, 90 was our best one-way figure for the flying quarter, aided by an appreciable wind. Some comments on this discrepancy are in order. First, the car tested had passed the first flush of youth, having done over 13,000 miles. This had included countless timed speed and acceleration bursts, partly in the course of the converters' own development program and partly on showoff runs for prospects' edification. (The prospect immediately ahead of us in the queue, incidentally, was the young Duke of Kent, making this the first time we'd had our seat cushions warmed for us by princely pants. The Duke is known as a Rapier owner and devotee, but Alexander's sense of etiquette forbade them to reveal whether their Minx had wooed him over).

Second, the carburetion on the test car was not fully *au point*. On the other hand, it was impossible to judge whether the particular malfunction that it manifested, viz., a marked flat spot at low revs and load, produced a corresponding enfeeblement at the top end. Third, it may well be that the claimed maximum would have been neared if we had timed the car with the air cleaners off. We deleted them after the flying quarter and acceleration runs to give the camera a better look at the under hood installation. According to Alexander, their conversion is sensitive to restrictions on the inhaling side of the SUs, one theoretically suitable air cleaner

(Continued on page 59)

TEST CAR: ALEXANDER CONVERSION MINX

TOP SPEED:

Two-way average	85 mph
Fastest one-way run	90 mph

ACCELERATION:

From zero to	Seconds
30 mph	4.8
40 mph	7.6
50 mph	10.8
60 mph	15.1
70 mph	21.9
Standing ¼ mile	20.8
Speed at end of quarter	67 mph

SPEED RANGES IN GEARS:

	Std.	O.D.
I	0-27	
II	0-39	
III	5-64	5-84
IV	12-Top	12-Top

SPEEDOMETER CORRECTION:

2 percent fast throughout range.

ODOMETER CORRECTION:

Accurate (police checked)

FUEL CONSUMPTION:

Hard driving ..... 24.4 miles per U.S. gallon.

BRAKING EFFICIENCY: (10 successive emergency stops from 60 mph, just short of locking wheels):

1st stop	69
2nd	69
3rd	66
4th	59
5th	60
6th	63
7th	55
8th	55
9th	55
10th	53

SPECIFICATIONS

POWER UNIT:

Type	In-line four
Valve Arrangement	Overhead, pushrods.
Bore & Stroke (Engl. & Met.)	3 x 3 ins.; 76.2 x 76.2 mm.
Stroke/Bore Ratio	1/1
Displacement (Engl. & Met.)	84.8 cu. ins.; 1390 cc
Compression Ratio	8.6/1
Carburetion by	Two semidowndraft SUs
Max. bhp @ rpm	70 at 5200
Max. Torque @ rpm	75.8 at 2700
Idle Speed	No tach. fitted.

DRIVE TRAIN:

Transmission ratios	
I	3.58/1
II	2.48/1
III	1.49/1
IV	1.00/1
Final drive ratio (test car)	4.75/1
Overdrive final drive ratio	3.62/1
Axle torque taken by	Leaf springs.

CHASSIS:

Wheelbase	96 ins.
Front Tread	49 ins.
Rear Tread	48.5 ins.
Suspension, front	Coil and unequal wishbones.
Suspension, rear	Semielliptic leaf.
Shock absorbers	Girling telescopic.
Steering type	Burman worm and nut.
Steering wheel turns L to L	2¾
Turning diameter	34 ft. 3 ins.
Brake type	Lockheed hydraulic, 2LS front.
Brake lining area	92 sq. ins.
Tire size	5.60 x 15

GENERAL:

Length	160.5 ins.
Width	60.5 ins.
Height	58.0 ins.
Weight, test car	2222 lbs. unladen but with full tank.
Weight distribution, F/R	57/43 unladen.
Fuel capacity	8.7 U.S. gallons

RATING FACTORS:

Bhp per cu. in.	0.83
Bhp per sq. in. piston area	2.48
Torque (lb-ft) per cu. in.	0.89
Pounds per bhp—test car	31.8
Piston speed @ 60 mph	1980 fpm in direct drive; 1500 in O.D.
Piston speed @ max bhp	2600 fpm
Brake lining area per ton	82.8

WHENCE COME THE HORSES

Part III

By KARL LUDVIGSEN

COMBUSTION CHAMBERS

THE NEAR-PERFECT mixture distribution given by a carb for each cylinder, not to mention by fuel injection, has allowed steady increases in compression ratios. Reduction of hot spots by better head and valve stem cooling has also helped, as has the high latent heat of methanol fuels. The direct result has been a reduction in the combustion chamber clearance volume, to the extent that chamber shapes are taking on some very unusual contours.

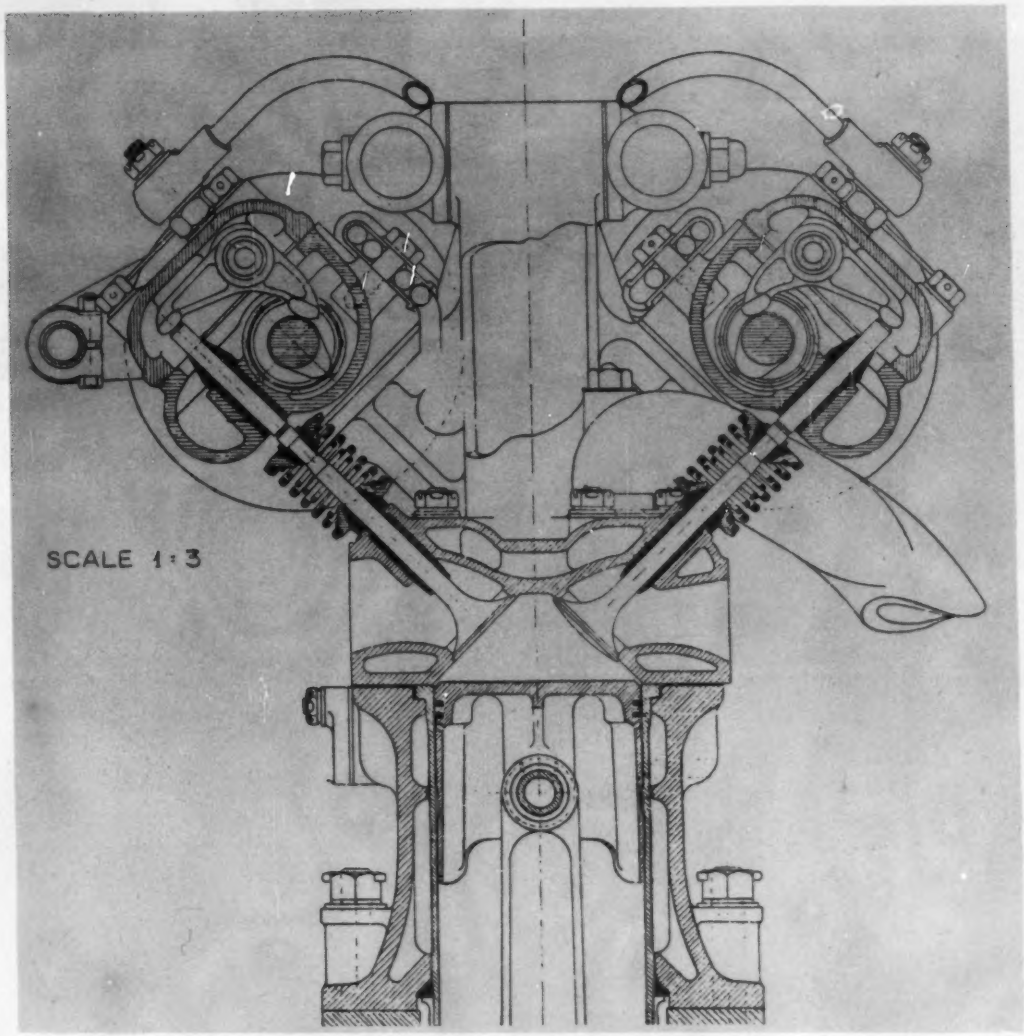
With the pure hemispherical chamber, the shape of which is well suited to gas flow paths from the ports, it was long quite adequate to put a similar dome on the piston if a compression raise was needed. As the domes got higher, though, the actual combustion chamber volume started to look more and more like a teacup, and acquired a spread-out shape that made combustion hard to control. Also, as mentioned in the previous section, the possibility of floating valves on most engines, plus the very radical cam contours used, necessitated valve clearance cutouts in the piston heads. These often can be hot spot sources, and form pockets where charges of unburned mixture can lurk. All these problems are aggravated by the big bore sizes now being used, and the big valves that are necessary.

Most top designers have seen this difficulty coming, and have ambushed it with a new outlook on piston and chamber shape. Instead of starting with a lump in the middle of the piston crown, and expanding it when required to raise compression, they now fit the top of the piston as closely as their nerve allows to the interior of the head, and leave clearance bevels for the valves. The actual piston top is quite flat, and the chamber center that it faces may have a variety of shapes. That is, if you lay the cylinder head on a bench, chamber side up, and insert spacers to provide for the required valve cutouts, and then pour into this chamber a quantity of liquid corresponding to the combustion chamber volume desired, then the piston crown could be cast in the remaining volume (except that the "squish" area *must* have a finite thickness).

This approach gives a much more compact actual chamber, and the very close fit at the sides between the valves acts as a "squish" area and improves turbulence. Its efficacy was proved by G. M. Research, who built two similar cylinders with 9/1 compression ratios — one with a conventionally domed piston, and the other with a close-fitting flat-topped crown. The ordinary rig put out a peak imep of 156 psi, but it required 98 octane fuel to do it. 161 psi were delivered by the newer design, on only 92 octane, showing that the latter still had room for further development.

Ways of carrying this out still differ greatly, of course. One of the more extreme is the special factory Jaguar head, which accommodates pistons whose sides rise vertically right to the top, except for the long, straight valve clearance bevels. Twin plugs ignite the charge at opposite ends of a split-banana-shaped chamber. Maserati's chambers are similar, but the pistons have been made to fit their rounded shape, and not vice-versa. They resemble the latest standard Jag pistons.

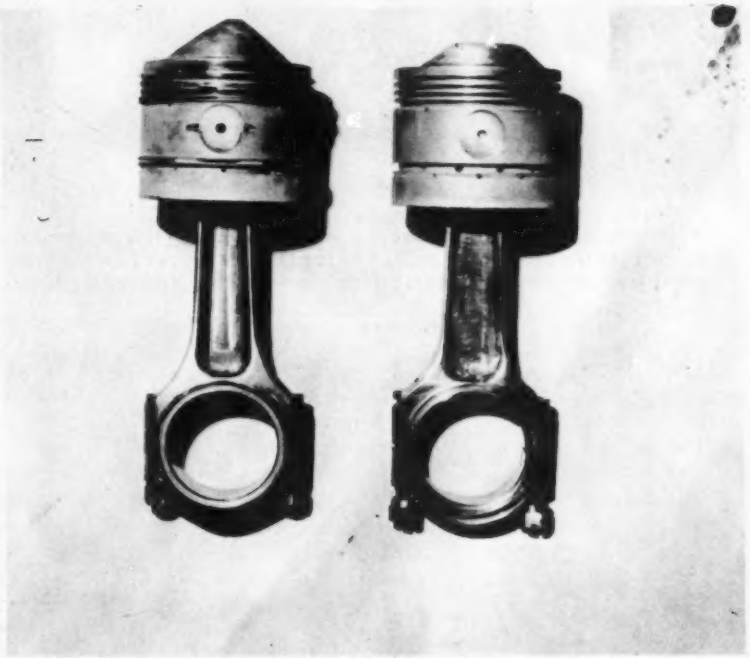
Ferrari gets full credit for wide experimentation in this field, and only recently, with the help of Lancia work, has



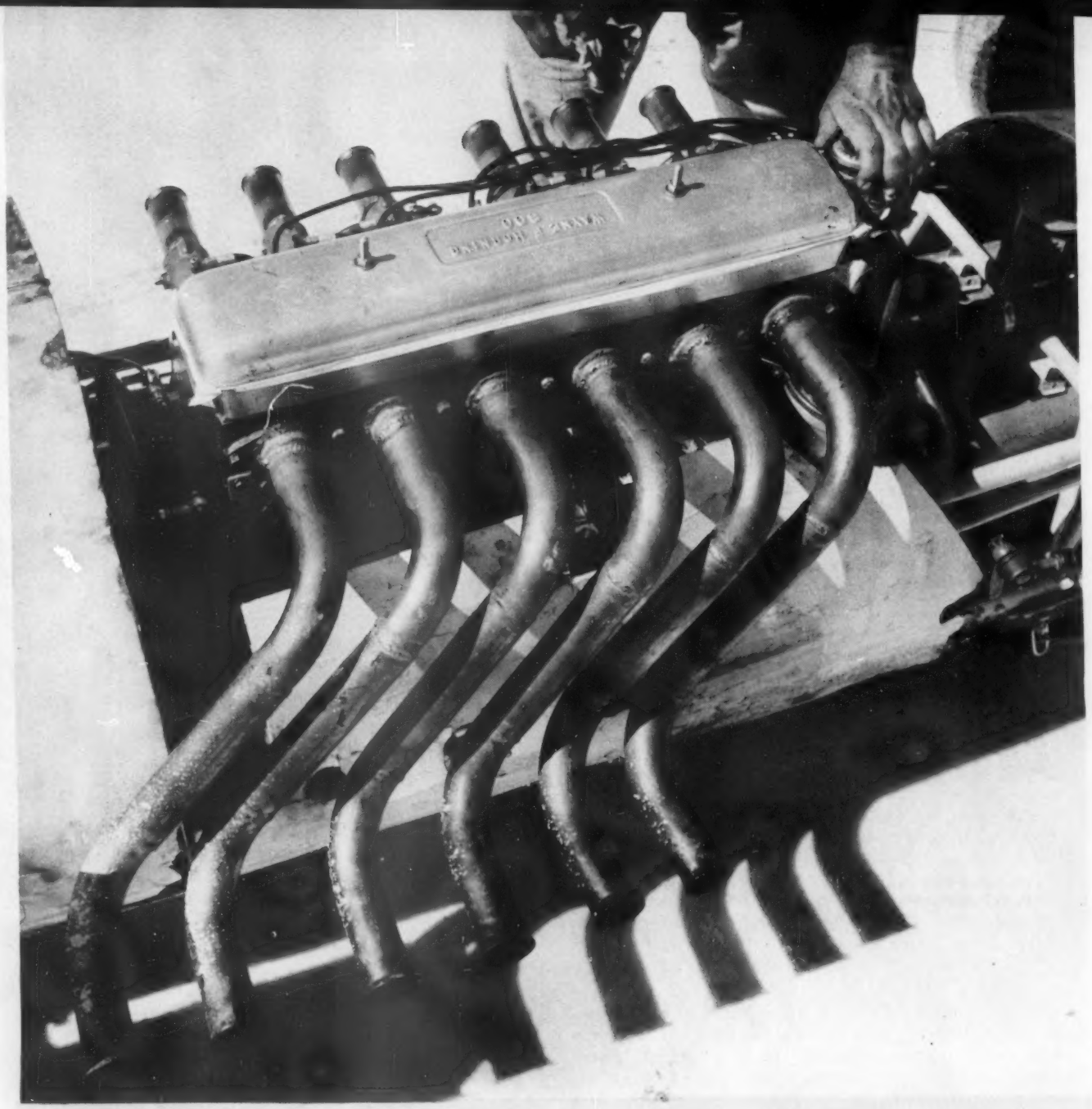
"One of the most remarkable power units of all time," Ricardo's unblown 1922 T.T. Vauxhall 3 liter (85mm x 132mm) developed 3.66 bhp/sq. in. of piston area on a compression ratio of only 5.8/1.

(The Grand Prix Car, Vol. 1, Pomeroy, 1954)

This Ferrari slug demonstrates vividly the new piston crown design method detailed in the text.



Another way to raise compression is to cast a smooth lump on top of the piston, but the taller mound has more surface area, dissipating heat, losing some power gained.



Given the advantage of separate ports, huge improvements can be achieved solely through choice of proper lengths for the intake ram tubes and the exhaust pipes. The diameter is also important and there must be no restrictions or abrupt changes in cross-sectional area. Sweeping bends, shown here, preferred to sharp ones.

come to the same conclusion. One of the latest experimental Maserati four-valvers agrees with Ricardo's 1922 Vauxhall, in that the answer is a pure pent-roof chamber with a spark plug at each end of the "ridge pole." Mercedes, of course, has the ultimate in tight, high-turbulence chambers, since there are only the slightest chips off the piston crown for valve heads, which are held back by the closing cams. It's the best design yet for piston engines, allowing the highest possible compression ratio with a given fuel.

Hand-in-hand with chamber shape goes the placing of the valves – their size, number and angle. It was once enough to angle the two stems at 45 degrees to the vertical, with a 90 degree included angle, and let it go at that. With the emphasis now placed on the big intake valve, though, and maximum use of the available space, the intake valve stems have moved closer to vertical, and the exhausts have been angled away. With larger bore diameters, the included angle between the stems is generally reduced.

Typical are the JAP 500 cc four, and the works Jag head, which have intake valves at 35 degrees to the vertical, and exhausts at 40 – an included angle of 75 degrees. Colombo's redesign of the six cylinder Maserati in 1953 gave the factory designers a good lead. It had a 36 degree intake and 41 degree exhaust, while the very latest small four barrels are 39 and 41 degrees respectively. The big Ferrari fours have a wider angle than most, with 40 degrees intake and 45 exhaust.

The same solution was used by Mercedes, whose M196 engines had 46 degree intakes and 51 degree exhausts. Recognizing that the near-vertical intake was the best, the Merc designers followed through by using a vertical intake port, instead of the popular horizontal layouts. This gives a much straighter port, and should be seen more often in the future, particularly in V-type engines. The 1957 Ferrari-Lancias, with their carburetors cramped tightly together, show how

hard it is to squeeze straight tuned ports between the banks of a vee. This is also the general motive for the downward-angled ports being adopted by Maserati.

Another worthwhile experiment is the three-valve head of W. T. Oliver's 2½ liter V8 for Speed Engines Ltd. Two intakes are used, not for maximum area but, according to the designers, to keep gas velocities *high*. The two-valve side of the chamber is pent-roof, while the exhaust valve seats on a part-spherical section. We fear that their view of gas velocities is antiquated, though, and feel that a single intake and double exhaust would have more potential.

With valves just as close together as possible, there's no room in the center of the chamber for a spark plug, so they have to move to one side. In every top-line racing engine, this means two plugs per cylinder, fired by twin magnetos. Addition of the second plug meant 11 more horses for Colombo's Maserati engine. No longer is masking of the plug points, or "cartridge fire," felt to be necessary. Reduction of plug size to 10 mm reduces heat range, but increases valve space.

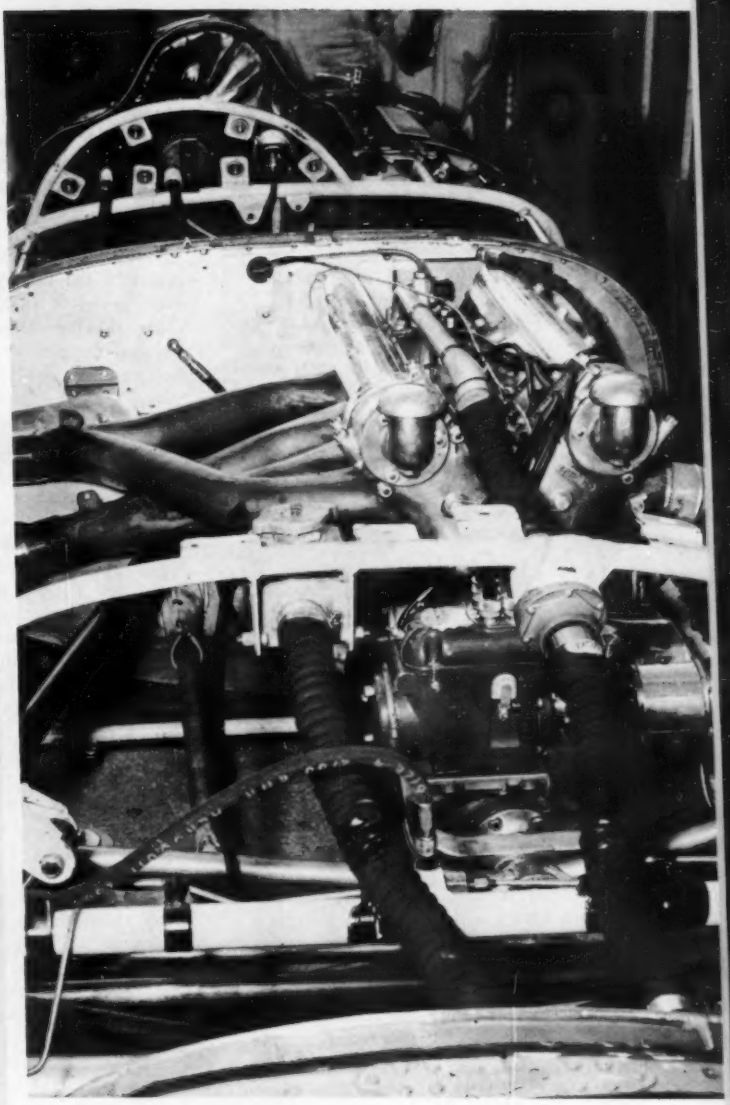
EXHAUST SYSTEM

Final step in the job of pumping the maximum weight of air through the engine is the design of the exhaust system. Since this is right out in the open where it's easy to get at, practically everyone in the business has tried his hand at improving it. The best and original inspirations came, like tuned intakes and hairpin valve springs, from the world of motorcycling.

Exhaust and intake tuning naturally must be closely matched with each other, and with the valve overlap as well. Proper tailpipe design can ensure that the combustion chamber is thoroughly scavenged of burned gases. This is done with the help of the fresh charge, which, after all, does the actual scavenging under the impulse of the intake tuning rhythm. To do the job right, some of the fresh charge must pass on out into the lead section of the exhaust port. A good exhaust system will be so designed that a positive pressure pulse (see ram intake section) will be returning from the outer end just in time to shove this fresh charge back in an instant before the exhaust valve closes. If this seems unlikely, recall that such pulses travel four or five times faster than the gases are moving out, and have plenty of time to do the job.

Cycle tuners were the first to bring this to a high pitch, having only one or two pipes to worry about. Megaphones and reversed cones are esoteric variations on these, and all have been welcomed by racing engine designers, who still love one tuned pipe per cylinder. Like the tuned intake, though, this particular layout is really effective only at a

(Continued on page 63)



Pairing the exhaust pipes of cylinders which fire 360° apart will further assist scavenging over a certain rpm range, the distance from the exhaust valve to the junction again being critical, whether the engine is a 91 cu. in. MG (below) or an Offenhauser 270 (above). In both cases the firing order is 1-3-4-2.

Galahad

(Continued from page 17)

Campbell, he confessed he was thinking of renouncing all his worldly possessions and retiring into a monastery for the rest of his life.

(He didn't, so don't go away).

That Straight's qualities as a driver were genuine, and not just chimera conjured up by the glamor-drunk hacks of Fleet Street, can be verified by consulting such austere authorities as the *Motor, Sport* and Capt. George Eyston. Writing of Whitney's Coppa Acerbo exploit in '33, the *Motor* said "the result staggered the natives, for there was exceptionally stiff Maserati opposition". Incidentally, although Straight won this race by only a fifth of a second, it wasn't quite the closest thing of his career; the previous year, driving a borrowed Bugatti in a Brooklands Mountain race, he had dead-heated for first place with another fellow on a Bug. There were, I believe, only about three ties in the entire 32-years history of Brooklands.

Following Straight's Mont Ventoux triumph, recalled earlier, sobersided *Motor Sport* classified this upshot as "a performance which will rank as the outstanding achievement of its kind during 1933". And Eyston, in his book entitled *Motor Racing and Record Breaking,* had the following to say about the reluctant millionaire:— "The ability necessary to run successfully in important Grands Prix can usually be acquired only by constant driving in lesser events . . . Yet occasionally a driver will appear who is so gifted that, with very little experience, he can challenge men with years of race experience behind them. Such a man is Whitney Straight".

Paradoxically, in spite of Straight's avowed distaste for riches, it irked him to run his racing affairs on a non-paying basis. This was the footing on which most, if not all, of his British friends and rivals perforcedly ran theirs, and for two reasons: one, by sacred precedent, the English race promoting bodies of the day never paid a penny of starting money or expenses to their own nationals or to foreigners who, like Straight, were domiciled in Britain. Two, although there were a few English drivers who habitually traveled to the continent to race, the relative inferiority of their equipment gave them a mediocre starting money rating, and anyway their self-imposed standard of gentlemanly conduct was liable to be an obstacle to sordid bargaining.

Straight, unencumbered by such scruples, and adequately heeled to ensure that *his* equipment wasn't inferior, resolved to intersplice pleasure and business. In preparation for 1934 he therefore floated a company, Whitney Straight Ltd., and, upon this structure, set up the first continental style scuderia ever to operate from the U.K. Although, as it developed, the stable's lifespan was limited to one season, owing to its founder's grievously premature retirement, it did things on a big scale while it lasted. Swank offices were leased in one of London's most expensive hubs of commerce, and presided over by a former factotum of Sir Henry Birkin, one Bill Lambert. Three brand new G.P. Maseratis, of the latest 3 liter type designed for the 759 kilogram formula that was inaugurated in '34, were bought from the Maserati brothers in Bologna. As continental meets predominated in the schedule Straight had mapped, the cars were based, and elaborate workshops established, in Italy: to be exact, at Milan, conveniently close to Bologna.

An experienced staff of mechanics, five of them former Birkin employes, were engaged, and put under the orders of the celebrated Guilio Ramponi, co-driver of the Mille Miglia winning Alfas in 1928 and '29. Under Ramponi's knowing supervision, and with aid from Reid Railton, radical modifications were carried out on all three cars before they were considered ready for the fray. These included the replacement of the makers' crash type gearboxes with preselector jobs of Armstrong Siddeley design, and the transformation of the front ends by fitting special cowls to Straight's own drawings. As delivered, the 8 cylinder 65 by 100 millimeter engines developed 265 bhp at 5800 rpm, giving these single seat cars a top speed of around 165 mph.

Campaigner members of the scuderia, apart from Straight himself, were Hugh Hamilton and Buddy Featherstonhaugh, Englishmen both. Hamilton was already rated among Britain's top three drivers, but it is doubtful whether the latent virtuosity of Featherstonhaugh had been recognized by anyone but Straight up to that time. It was a shared interest in the homely saxophone, on which Buddy was an internationally renowned tootler, that originally had brought him and Whitney together, Featherstonhaugh's Maserati fingering proved at least equal to his sax technique, as he demonstrated by beating Hamilton into the winning spot in the 1934 Albi Grand Prix. If it hadn't been for the liquidation of the stable at the end of that season, this discovery of Straight's, like Straight himself, might eventually have rivalled the fame of Dick Seaman.

Dick, by this token, although not under formal contract to Whitney Straight Ltd., did in fact string along with the stable on its frontier hopping travels, and shared its facilities and services. Seaman and Straight had entered Trinity College, Cambridge, in the same term, two years earlier, and been close friends all along. The American's rise to racing stardom had of course preceded Seaman's, and although Whitney plays down the suggestion that his influence and example may have had a significant effect on the course of Dick's career, many people think otherwise.

The bare statistics of Straight's personal record in continental Europe and Africa during 1934 do less than justice to his absolute brilliance as a driver. This for two reasons: then as now, even the best equipped independent was constantly one move behind the works drivers as far as cars were concerned. Two, although the Milan establishment admittedly was well staffed and richly appurtenanced, the program of races undertaken was so large and farflung that even these resources must have been strained at times. Straight himself contested no less than ten continental meets, six in England, three in North Africa and one in South Africa, as well as making two successful record bids at Brooklands on non-race occasions. That makes 22 engagements in one season, involving vast intermediate mileages, and takes no account of involuntary non-starts through mechanical unreadiness or blowups during training.

In the early phase of the enterprise, incidentally, the job of pit manager was handled by a man whose name, face and beard have subsequently become familiar to international audiences—James Robertson Justice, the movie actor, whose recent roles have included the millionaire equipe owner in *Checkpoint,* an improbable piece about an imaginary race in the Mille Miglia manner. Justice wasn't a very good pit manager and Straight fired him.

Twice in 1934, when facing opposition from *maestri* of the Alfa and Maserati persuasions, Straight placed fourth, just out of the money. In the first of these encounters, the Casablanca Grand Prix, he was only beaten by the great Louis Chiron (Alfa), then at the height of his legendary torm, Phillipe Etancelin (Maserati) and Marcel Lehoux (Alfa). The other time, in the Montreux G.P., the placemen were Count Trossi (Alfa), president of Scuderia Ferrari, Etancelin again, and Achille Varzi (Alfa).

Then, as the season went on and Straight gained in confidence and racecraft, he did better still. After winning his heat of the Vichy Grand Prix, ahead of Lehoux, René Dreyfus (Bugatti) and the then youthful Giuseppe Farina (Alfa), he finished second to Trossi in the final. The Comminges G.P. brought him a hard earned third, two places up on Jean-Pierre Wimille, while in the classic Italian Grand Prix, dominated by the Mercedes and Auto Union teams, he took a fraction of one second longer than the lowest placed Auto Union (Momberger and Sebastian) to cover the 311 miles. It may well have been this performance that opened the eyes of Herr Willy Walb to Straight's potentialities, the Auto Union being decisively a faster car than the privately owned Maserati.

Back home in the land of his adoption —he had meanwhile become a British citizen—Straight's successes were spectacular. At Brooklands he won the 260 mile International Trophy, repeated his 1933 victory in the Mountain Championship, raised his own Mountain circuit lap record yet again, and broke the international Class D records for the flying mile and kilometer at 135.49 and 136.98 mph. These figures, much to the credit of Ramponi, established the pick of the stable's

Maseratis as the world's fastest 3 liter car. At Shelsley Walsh, Straight chiseled 1.2 seconds off his own record for the thousand yards hill; it has never since been beaten by a margin that big.

Straight only once drove an American car in competition and it gave him the biggest scare he ever had on wheels. In 1934, Scuderia Ferrari sold him a 4.3 liter Duesenberg that Trossi had driven in the 1933 Monza Grand Prix. Originally built, I believe, for Indianapolis, this was a rangy brute with a mean disposition. Showing remarkable courage, Straight undertook to use it for an attack on the main circuit lap record at Brooklands, standing to John Cobb and the 24 liter Napier Railton at 140.93 miles per hour. And on October thirteenth, 1934, in one of the stoutest exhibitions of unarmed combat the old track had ever seen, young Whitney turned a lap at 138.78 mph — a shortfall of 2.15 When you allow for a displacement handicap of 19,594 cc, and the fact that the Duesenberg, with chassis rails seemingly made of blancmange, was most of the time going one way and pointing another, the failure is seen as an honorable one. Anyway, it set a Class C lap record which, in the remaining five years of the circuit's survival, was never beaten.

One of the track institutions was the award of a special badge to drivers who lapped at 130 or over. Only 17 of these trinkets were ever struck, 15 of them in recognition of speeds inferior to Whitney's. Although he isn't much given to living in the past (he recently sold all his racing cups and other prizes), his current S-series Bentley carries a single inconspicuous adornment on its front bumper: his 130 mph Brooklands badge.

His fast mental reaction in racing crises was an integral part of the Whitney Straight legend. Twice during 1933 his quick catch-on saved him from at least a severe roughing up, possibly worse, and carried him scatheless off the scene of a ruckus. The first time was at Vram in the Swedish Summer Grand Prix, where he was driving a borrowed Alfa. At an early corner on the first lap, eight cars tangled violently, one of them somersaulting and catching a house on fire at the roadside. Straight and Louis Chiron, who had drawn back-row positions in the ballot for grid precedence, came around a blind curve and found themselves headed for the pyrotechnic picnic at high speed. Our boy millionaire picked a path through the flames and debris (a riding mechanic had been killed), and went on to place second to Antonio Brivio of the Ferrari Alfa team. As he entered the wreck zone, Straight had taken time for a quick peek in his mirror—and seen Chiron, who wasn't exactly a cerebral sluggard himself, diving off into a ditch.

The other occasion was at Brooklands in the Mountain Championship. The title holder, Malcolm Campbell, built up a quick lead on the first lap, then spun and stalled his 4 liter V12 Sunbeam across the track at a point where it couldn't be seen by oncoming drivers until too late for evading action. Tim Rose-Richards, first on the scene, set about establishing a ferrous stockpile by leaning his Bugatti on the Sunbeam. At that, officials on the spot rushed to a better signaling base and waved frantic warnings to a group of four who were approaching like the hubs of hell. Three of them—and these included Piero Taruffi—interpreted these calisthenics too literally for their own good. Seizing his chance while they were still in their brown study, Whitney went under their elbows and into the lead, thereafter holding it to the finish.

His mastery of the short but tricky Mountain course became one of the bywords of Brooklands and inspired the following tribute from the track's own shoptalk organ, *Brooklands Gazette*: — "His driving of the Maserati was nothing short of phenomenal. Time after time he would approach his corners at a speed that made even hardy oldtimers swear he could "not possibly get round". He always did, though."

If a warning by Straight hadn't miscarried or been ignored, one of the saddest chapters in Italian racing history might never have been written. Race in question was the Monza Grand Prix of 1933, in the second heat of which Giuseppe Campari (Alfa) skidded on a patch of oil and was rammed by the Maserati of Mario Borzacchini. Both men were killed. It later transpired that Straight, after placing fourth in the first heat, had sent a mechanic to race control with a message suggesting a postponement of the second heat to enable the oil to be burned off. Either the tip didn't reach the right ears or they didn't think it was a good tip.

Scuderia Whitney Straight had a grievous bereavement of its own the following summer, when Hugh Hamilton crashed fatally on the last lap of the Swiss Grand Prix at Berne. What was left of the Maserati he was driving would never have gone together to make a racing car again, so it was sold for scrap metal for a few pounds. Of the two 3 liter Maseratis that survived the dissolution of Straight's company, one was sold to B. Bira (Prince Birabongse) and started on a new and triumphant lease of racing life, and the other was made over into a dreamboat of a sports two-seater to its owner's body design. The ex-Bira car is still a pacemaker in vintage races around the airstrips and road circuits of England.

Although, as his dossier shows, Straight was certainly no dawdler in widely differing forms of go-around racing, he perhaps excelled above all as a speed hillclimber. As well as having a natural aptitude for the specialized technique used in overcoming Sir Isaac Newton's wellknown law, he made a smart move at the outset by having his first Maserati (and of course the subsequent ones) fitted with a preselector gearbox. This was an invaluable aid on the close pitched and usually tight turns featured in hillclimbs, whether of the putt length English variety or in the continental manner as exampled by the 13½ mile mountainside ascent of Mont Ventoux. For another thing too, he always ran in climbs with dual rear wheels, thereby doubling traction. It was largely the combination of these two features that enabled him to administer such awful punishment—a 40.8 second cutback —to Caracciola's Alfa record at Ventoux in 1933.

He carries a physical reminder of long-ago preselector exercises on his person to this day, and presumably always will. Very first time out after he'd had the 2½ Maserati converted to this A-1 box, in the Marne Grand Prix of 1933, the transmission ran such a temperature that his right foot was badly burned by contact with the gearbox casing. Although in acute pain, he stuck out the statutory 250 miles and placed fourth.

Variously bedight in white-and-blue and plain black paint jobs, the former until he switched nationalities and the latter afterwards, the Straight cars were always a standout for impeccable cleanliness and pulchritude. He also originated a fashion in British racing circles by having a personal insignia on his cars, his device taking the form of a red and white flash.

Straight never actually got into the lineup of a sports car race, but only just not: at Le Mans in 1934, he and Prince Nicholas of Rumania were paired to share the biggest car in the entry, a blown Duesenberg about a parish and a half long. It ran into mechanical woe during practice and so didn't start. Dimensionally, this Duesenberg was probably the biggest car Straight ever drove, but not the biggest in displacement. As a street driver, in fact, he was quite a glutton for liters. When, for instance, he inspected the wares of Hispano Suiza with a view to purchase, and discovered that their V12 bolide went only 9½ liters, he trousered his check book in disappointment. However, not to be done out of a sale, Hispano did a boring and stroking job that yielded eleven liters, so the deal was on after all. Two of these monsters, with bodies by Fernandez and Darrin that certainly couldn't have been bought out of a stonemason's pay pack, were built, one for Straight, the other for Count Carlo Felice Trossi. They were so heavy that no power on earth would stop them, so Whitney stopped driving his, thereby surviving to serve with great distinction in the RAF during WWII (Commander of the Order of the British Empire, Military Cross, Distinguished Flying Cross), and to attain his present eminence in the world of aviation and commerce.

It could be that international motor sport hasn't yet heard the last of the Whitney Straights. He has two daughters, one of whom has an itch to race. Will he let her? Well, he doesn't see why not. For one thing, he could hardly forbid this project and still nurse his own itch for a comeback. In this ambition, at the age of 45, he is being jollied by offers of tryouts for BRM and Aston Martin. As both the F1 BRM and the R1/300 Aston develops around the same power as Straight's Maseratis were doing in 1934, the experiment shouldn't unman him.

—*Dennis May.*

Turbo

(Continued from page 19)

safe speed for the banked turns. In the meantime, with no publicity, some Detroit research laboratories have been quietly testing turbochargers on their production and experimental engines.

In early April of 1956, A. L. Boegehold, Manager of Research Staff Activities of General Motors Corporation presented a paper on "Materials in the Automobile of the Future." In his work, when speaking of automotive trends for the next 15 years, Mr. Boegehold said, "We can also consider the possibility of turbo supercharging in commercial engines and sports cars to do two things:

1. To get better fuel economy.
2. To get increased horsepower per unit of size.

He then mentioned that passenger cars run at reduced load too much of the time to make turbocharging profitable. Another portion of Mr. Boegehold's paper contained two exceptionally candid charts in which are compared nine different engines. Of great interest to readers of Sports Cars Illustrated is an Aluminum 8:1 compression ratio gasoline engine *turbocharged by a 30% boost*. As compared to similar engines of 9:1 and 12:1 compression ratios, the turbocharged unit was lightest and smallest per horsepower developed. All this on 95 octane gasoline as compared to 110 octane required to operate the 12:1 compression ratio test engine.

What else Detroit is doing with turbochargers remains to be seen. But you can bet your bottom dollar that if GM is toying with exhaust turbines—Ford, Chrysler and the independents are blowing up a few private power storms of their own.

At the present time turbochargers are produced by many truck engine manufacturers, including Cummins and Mack. Independent producers include the Garrett Corporation, making units for use on truck and Caterpillar diesels; Brown Boveri and Company, Baden, Switzerland; and Maschinen-fabrik Augsburg-Nürnberg, Germany. Brown Boveri is reported to have established a whole family of exhaust driven superchargers suitable for gasoline and diesel engines of 75 to nearly 400 horsepower. Their units are controlled by a wastegate in the piping between exhaust manifold and turbine inlet. Location of this control would be at "B" above the turbine in our drawing of a typical turbo-supercharger.

Prices of a turbocharger are hidden in engine package prices and exact quotations for a separate turbocharger are not available. However, you might be able to order a small turbocharger from the Garrett Corporation, El Segundo, California, for as little as $300.

The serious fly in our "fly-low" ointment, and its a big bug too, is the problem of acceleration. A turbocharger, by virtue of being exhaust driven and having rotor inertia, can't help but lag behind acceleration of the piston power plant. Basically this problem exists with turbocharged engines because air supplied to the cylinders is a function of throttle setting. On the other hand, with a Roots supercharged engine, the available air supply is a function of engine speed and is independent of the power output of the engine at a given moment.

Extensive testing and experimentation has been conducted to increase the sensitivity of a turbocharger to its mating power plant. Von Der Nuell points out in his paper "Superchargers and Their Comparative Performance" that when an exhaust turbine is equipped with variable area nozzle control there is almost unlimited freedom with respect to boost pressure in relation to engine rpm. He thus underlined the usefulness of control nozzles to provide adequate boost pressures concurrent with demands for acceleration power.

Other research by N. M. Reiners and W. E. Woolenweber of the Cummins Engine Company, Inc., disclosed interesting points concerning exhaust gas transfer. In one test an exhaust manifold common to all cylinders was fed to a test turbine. It showed power increases of 30%, which were limited by high exhaust temperatures. The manifold was then divided, with three cylinders feeding to each side; then into a single turbine inlet casing. This second alteration reduced exhaust temperatures and permitted power increases of nearly 50%. A third test completely divided the cylinders into two groups all the way from valve to turbine wheel. Exhaust temperatures were now maintained at the permissable limit, but power increases reached a whopping 75% for a test bed six cylinder diesel engine.

Other tests by Reiners and Woolenweber show that the length between cylinder port and exhaust turbine is best, when short as possible. Unnecessary bends should be eliminated, and diameter of the exhaust manifold must be held small enough to conduct high velocity exhaust pulsations to the turbine as rapidly as possible. But velocity restrictions should not be so small as to create undesirable pressure losses. Their experience shows that when an exhaust turbocharger is substituted for a gear-driven supercharger on diesel truck engines, a definite improvement in mileage occurs. The reason for this is that a 300 horsepower engine has to use nearly 35 extra horsepower in driving the supercharger, which 35 horsepower does no useful work at the flywheel. When a turbocharger is attached to the engine in place of a mechanically driven supercharger, the entire available brake horsepower turns the flywheel, which results in dramatic savings. Exhaust gases are traveling at such high speed when they come out of the engine, that turning the turbocharger adds little back pressure.

Dr.-Eng. W. T. Von Der Nuell has this to say about diesel turbochargers. "A well built, simple modern turbocharger of the single stage type and of the same high standard as is now found in comparable gas turbines, can easily increase the density of ambient air by a factor of more than two, which when applied to a diesel engine, can result in twice or more than twice the power output of the self-aspirating diesel engine. By using an air cooler between the turbocharger outlet and the diesel engine inlet, the density ratio between ambient and engine supplied air could be made higher than three, resulting in something like thrice the power output provided the diesel engine was developed to stand up under such loading." (Editor's note—this means *thrice* the power of an unblown engine!)

As we mentioned previously, applying turbochargers to automobile engines is not presently the subject of much known laboratory work, except by the references to GM's work in Boegehold's paper. The big hitches to automotive production use being that turbocharger boost pressures were not available until after the engine had reached speed, and the high cost of critical materials to withstand exhaust temperatures.

The first problem is known as "the poor acceleration characteristics" of older turbochargers. However, such negative engineering thinking was based on the premise of 1940 auto engine design. At that time automobile engines had to be extremely flexible, generating tremendous amounts of low speed torque so that suitable power would be available at the rear wheels with a minimum of gear shifting. Today's engine generates power well up the rpm curve and torque multiplication is taken care of by automatic transmissions or 4 and 5 speed gear boxes. There seems to be little reason why a carefully adapted, presently available turbocharger would not only provide heart-warming boosts in engine power, but could increase economy as well. Or to take this a step further: A smaller, lighter, and more economical engine could be turbocharged to produce the power of a weighty big brother. Through the use of torque multipliers this lightweight power package would incite rather rapid movement in today's road or track machinery.

With these facts in mind, the logical question becomes one of, "Let's bolt it on." But unfortunately, commercially available diesel turbochargers have one presently serious drawback. The exhaust gas of an automobile engine is several hundred degrees hotter than that of a diesel. And these few hundred degrees move the gasoline engine turbocharger from a production item to a specialty unit requiring expensive and highly critical materials. An inter-cooler of some type might be used between manifold and turbine to cool these critical gases before they strike the turbine wheel. Otherwise the engine would be "red-lined" at a point where exhaust temperatures would not creep into a critical heat range.

On the other side of the bread are the plus features of turbo-supercharging. One advantage is that available power production is limited only by engine design. An example of such a design factor is the usual intake manifold passage. On a naturally aspirated engine, reasonable velocities must be maintained in the intake manifold. Otherwise the engine will have difficulty starting and maintaining satisfactory low speed vaporization. With a turbocharged engine, little attention need be paid to inlet manifolds. Velocity becomes unimportant because vaporization of the mixture has already been secured in or by

the turbocharger. And (bless their hearts), bigger manifold passages will provide more total pressure at the inlet valves.

Valve timing can be improved with the addition of adequate exhaust-intake overlap, for a turbocharger (or supercharger) scavenges the cylinders completely of burned gases. Therefore, not only does the engine receive a compressed charge of fuel, but the charge is all fresh mixture rather than part exhaust gases as at the present time. By dilution, scavenging reduces the temperature of exhaust gas entering the turbocharger turbine wheel; which permits higher rotating speeds and boost pressures. Within limits established by reasonable gasoline economy, the more effectively cylinders are scavenged, the higher the maximum power rating of the engine can be increased by blowing.

A controllable result of turbocharging is the minor temperature rise of a compressed mixture, which can be reduced near ambient air temperature through use of an intercooler. Minor benefits include a reduction of exhaust noise. A turbine so thoroughly chews up exhaust gases that the staccato blast of a powerful engine is almost completely eliminated by simple straight through resonators.

Controlling the commercially available fixed nozzle turbocharger can be accomplished by any one of several methods. A waste gate or bypass valve could be placed between the exhaust manifold and turbine wheel. Opening the gate would pass surplus exhaust gas around the turbine, thereby controlling its speed by metering the amount of gas striking the turbine wheel. This waste gate should be coordinated to a throttle valve in the carburetor intake. Another control method would have throttle valves in both the exhaust and intake manifolds, working in unison to control both exhaust gases and fuel mixture.

A recent interview with Dr. Peter Kyropoulos of The California Institute of Technology, a leading authority on modern gasoline engines, fairly well summed up the turbocharger story. Said Dr. Kyropoulos, "Any turbocharger is a swap between compression ratio and boost pressure. But you will not have to lower the compression ratio if mechanical octane members are designed into the cylinder head. You could retain high compression for economy at part throttle—then turbocharge for maximum power." When we asked Dr. Kyropoulous about back pressure from installation of a turbocharger, he replied; "Certainly it will increase back pressure, but not in proportion to the boost obtained from the turbocharger. Your readers might keep in mind that the major control (for a turbocharger) is the waste gate, which could be controlled by a mechanism (similar to ignition advance systems) sensitive to rpm and manifold pressures."

So there it is, just waiting to be tried. The blower of tomorrow is available today, if you have time and the dollars necessary to experiment with it. Somewhere soon, someone's going to churn the track with a turbocharger; going like a bomb, and with all effects of the explosives dropped by Billy Mitchell from his warweary turbocharged Martin bomber.

William Carroll

3.4 Jag

(Continued from page 31)

Automatic downshifts from high to intermediate occur when slowing down from moderate speeds. This is not too noticeable, until the gas pedal is tromped again. Then the upshift is made back to high.

In normal driving, the 3.4 cruises smoothly at any speed, up to and including 90 mph. Noise level in the car is very low, and there is practically no vibration. In flat-out runs a low mechanical whine appears, but this is something the average user will not encounter. Wind noise is bad around the windows at higher speeds. The windows crank up quickly, with just a couple of turns on the handles. Sealing against wind and rain is excellent with the windows up. The two-speed windshield wiper tends to get noisy as the blades scrape and drag on a drying windshield. Operation of blinker turn signals is by a lever mounted on the left side of the steering column, and it was not until we drove the car at night that we noticed a small green light on the switch went into operation with the blinkers.

The heater fitted to our test car worked fine, although its warming efforts were confined to the front of the car. Rear seat passengers might find a lap robe comfortable in cold weather. A cowl in front of the windshield opens to admit cool air to the driver's feet, but driving on a warm day, the air that came through did not feel particularly cool or refreshing.

Like the 2.4, the 3.4 uses wishbones with coil springs for front suspension; torsion bars are used on other models. Rear suspension is by quarter-elliptic leaf springs and radius arms. Telescopic shock aborbers are used at both ends. Weight of the test car was 3180 lbs., with a full load of gas, oil and water aboard. Front/rear weight distribution, with driver in the car, was 58.3/41.7 per cent.

While the Jaguar 3.4 sedan does not provide sports car track performance, the engine's high power — 210 bhp at 5500 rpm — in a body that's a good deal smaller and about 400 pounds lighter than most American sedans, makes for remarkable agility in city traffic as well as on the express highways. Fuel economy is excellent; our test car gave 20.5 mpg in normal driving, and 17.2 mpg during our speed tests.

Summing up, the latest of Jaguar's "sports sedans" should be the answer to those who objected to the massiveness and conservatism of the Marks VII and VIII as well as to those who complained of the lack of sizzle in the earlier 2.4. This one should turn out to be one of Coventry's most popular exports — among the family set at any rate.

—Tom Bottomley & Karl Ludvigsen

EARN TOP SALARIES
BUILD AN EXCITING FUTURE!
READ:

YOUR CAREER IN ELECTRONICS

A NEW ZIFF-DAVIS PUBLICATION

This fact-filled volume prepared by the combined staffs of RADIO & TV NEWS and POPULAR ELECTRONICS is written for men who have a stake in the fastest-growing industry in the world—electronics! If you're eager and ready to move into a more advanced, higher-paying electronics specialty or want to begin an electronics career, don't miss this informative 132-page publication.

IT TELLS YOU

- **what job opportunities are available in electronics**
- **how to prepare for a job in electronics**
- **how to get a job in electronics**

CONTENTS

ELECTRONS, SLIDE RULES AND YOU—Careers in Electronics . . . Am I Too Old to Learn Electronics? . . . Women in Electronics . . . What About Tech Writing?

CAREERS IN PROGRESS—I am an Atomic Engineer . . . I Ride the Satellites and Rockets . . . I Make Electronic Brains . . . Electronics Stands Guard . . . Thank Me for Safe Air Travel . . . We Make Color TV . . . We're Looking for Tomorrow

SURVEY OF THE JOB MARKET—Personnel requirements of 150 of the largest electronic manufacturing firms—number of technicians, engineers needed, kind of background required, salaries offered, training given and opportunities for advancement.

COURSES, CREDITS AND DEGREES—Training for a Career . . . Home Study . . . College Training . . . Resident Schools

ELECTRONICS IS A PROFITABLE HOBBY—Spare Time TV Servicing . . . Use Your Hi-Fi Know-How . . . Build Gadgets for Money . . . Kits For Sale . . . Money from Tape Recordings

BASIC ELECTRONICS—A brief course in the fundamentals of electronics. It gives the beginner a knowledge of terminology and some familiarity with the electronics field.

BUY YOUR CAREER in ELECTRONICS
AT ALL NEWSSTANDS SOON
only 75¢

The New Sports Cars Illustrated Directory is a Glove Compartment Must!

FEATURES UP-TO-DATE *SERVICE* DIRECTORY AS EXTRA BONUS!

At last! A publication for sports car owners which includes a complete SERVICE DIRECTORY! Here you'll find an accurate listing of more than 1000 dealers and garages all over America equipped with parts and know-how to fix your foreign made car!

AND—CHECK THESE FEATURES

In the *new* SPORTS CARS ILLUSTRATED DIRECTORY

—on sale at newsstands September 19!

ROAD TESTS of 10 of the world's most popular sports cars. Six pages of authoritative road test data complete with pictures and all specifications on the AC Ace, Austin-Healey 100-Six, Chevrolet Corvette, Ford Thunderbird, Jaguar XK-140MC, MG-A, Mercedes-Benz 190 SL, Morgan TR3, Porsche 1600, Triumph TR3.

ROAD TESTS of American Gran Turismo Cars: Chrysler 300C, Dodge D-500, DeSoto Adventurer, Plymouth Fury, Studebaker Golden Hawk.

BUYER'S GUIDE—Performance data, manufacturer's specifications, facts, figures, and illustrations of production sports cars currently available. AC Ace, Alfa Romeo, Arnolt-Bristol, Aston Martin, Austin-Healey, Cooper, Corvette, Ferrari, Thunderbird, Jaguar, Maserati, Mercedes-Benz, MG, Morgan, OSCA, Porsche, Siata, Triumph.

BUYER'S GUIDE to limited production sports cars. Descriptions and performance data on:
Abarth, Allard, Berkeley, BMW, Bristol, Cisitalia, Dellow, D.B., DKW, Elva, Fairthorpe, Frazer-Nash, Gordini, Gregoire, Jensen, Jomar, Kieft, Lancia, Lister, Moretti, Nardi, Nichols-Panhard, Pegaso, Saab, Salmson, Stanguellini, Talbot-Lago, Turner, Volvo, W.D.

PLUS:

BUYER'S GUIDE to plastic sports car bodies—Fiberglass bodies to fit standard American frames . . . including dimensions, prices, listing of where available.

SPECIAL SURVEY ON ACCESSORIES—Facts, figures and prices of accessories and equipment to add to your car.

Don't Miss the SPORTS CARS ILLUSTRATED DIRECTORY
On Sale At All Newsstands September 19—only $1.00

1957 SPORTS CARS ILLUSTRATED

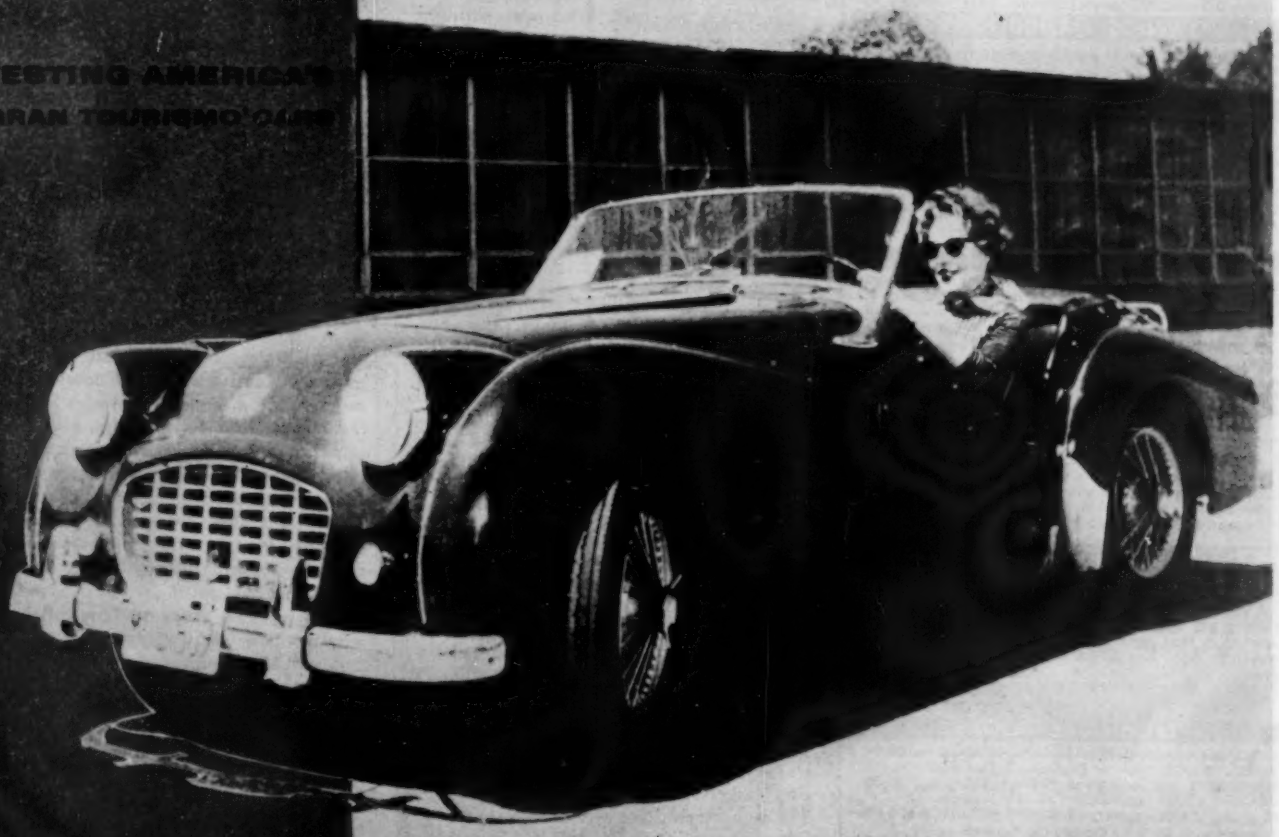
DIRECTORY

ROAD TESTS:
10 MOST POPULAR SPORTS CARS

BUYER'S GUIDE
· PRICE · SPECIFICATIONS · PERFORMANCE

COMPLETE LISTING OF THE WORLD'S SPORTS CARS

TESTING AMERICA'S GRAN TOURISMO CARS



SPORTS CAR PRICE DIRECTORY

SERVICE MANUALS
TUNING REPAIR MAINTENANCE

These Service Manuals are printed in Australia with full cooperation of the manufacturers & are packed with • Test Data • Specifications • Overhaul Procedure • Exploded-View Drawings & Photos giving the private owner or professional service man detailed knowledge & instruction for proper care & feeding of the beasts.

AUSTIN A 40 Devon . . .1947-52
A 40 Somerset . . . 1952-54
FORD Consul & Zephyr 1951-56
Anglia & Prefect 1953-56
V-8 & Mercury 1932-48
Custom & Customline 1949-54
Customline o.h.v. 1955-56
HILLMAN MINX . . . 1936-55
MG TD (with special tuning for TB, TC and TD engines)
MORRIS Minor, Series MM & ohv Series II
RENAULT 750 and 760 1947-52
VOLKSWAGEN to 1956
(Factory manual for Australia)

$6.95
Per manual
(Each printed line under the car heading represents a manual. One manual covers several models in some cases.)

SERVICE MEN
Write for leaflet describing new AutoServ repair book on foreign cars.

M G MAINTENANCE

M.G. WORKSHOP MANUAL (1930 to TF).....$8.00
Overhaul & tune any MG from bumper to tail light.
TUNING & MAINTENANCE OF MG's.....$4.00
Top British tuner gives details & pointers.
SPECIAL MG ENGINE TUNING.....$1.00
MG TD-TF SHOP MANUAL.....$6.50
MG "A" SHOP MANUAL.....$9.50
MG MAGNETTE (ZA) SHOP MANUAL.....$6.50

JUST OUT

TUNING & MAINTENANCE OF THE MG A.....$5.00
This book by Philip Smith (author of Tuning & Maintenance of MG's) is devoted entirely to the MG A & ZA Magnette. Here are the kind of tuning & maintenance tips not to be found in factory shop manuals, or in fact in any publication to date.
ORDER NOW for delivery from first shipment.

OTHER SHOP MANUALS

AUSTIN HEALEY 100.....(to 1956).....$9.50
CROSLEY (all Models).....$6.00
MORRIS MINOR.....Series MM & II.....$6.50
S.U. CARBS & FUEL PUMPS . . . (Factory manual) $3.50
Factory manual delivery subject to stocks available.

OWNERS HANDBOOKS

MG TF 1500.....$1.50
MG A.....$1.50
MORRIS MINOR Series II.....$1.50

CONSTRUCTION KITS

To accurate scale this new British plastic kit measures 6½" long after easy assembly with all parts & cement provided. First of an interesting series of sports & racing cars including.

$2.00

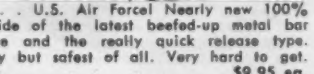
Also Ready . . . MERCEDES W 196 GP Car.....$2.00
SPECIAL . . . Both kits . . . $3.75

RALLY EQUIPMENT

Blackwell Average Speed Calculators are imported from England where they are an indispensable part of the Motor Rally Scene. Finest materials & workmanship are used to produce all of the following engraved heavy celluloid instruments.
Mk. I—Beginner's choice 5½" dial.....$4.50
Mk. II—For race or rally . . . 8" dial.....$7.50
Mk. IV—Long ones 3 to 3000 mi 18/180 mph....$12.50
Mk. V—Most accurate 6/60 mph 1/10 to 10 mi..$9.00
Leaflet describing all above on request

RALLIES TRIALS & GYMKHANAS.....$5.00
For Beginner . . . complete coverage that leaves no stone unturned . . . no question unanswered.
For Expert . . . polishes rough edges for SMOOTH finishes. ONLY complete book on the subject.

SAFETY BELTS



For racing . . . U.S. Air Force! Nearly new 100% Nylon, 3" wide of the latest beefed-up metal bar reinforced type and the really quick release type. Not too pretty but safest of all. Very hard to get.
Army type Belt.....$9.95 ea.
With swivel fittings ready to install.....$12.95

(Dealer Inquiries Invited)

TECHNICAL BOOKS

AUTOMOBILE CHASSIS DESIGN.....Averns.....$9.00
A TRUE DESIGN book for Engineers & Students.
The SPORTS CAR DESIGN & PREPARATION.....$6.50
Complete design requirements thoroly covered.
HI-SPEED INTERNAL COMBUSTION ENGINES....$12.00
Engine design Bible by Ricardo the top man.
AUTOMOBILE ENGINEER'S REFERENCE BOOK....$20.00
Only book like it in the world. Send for leaflet.
SPECIAL BUILDERS GUIDE.....$2.50
Handbook of British 750 Club. Many useful details.
SPORTS CAR BODY WORK.....$7.50
Drawings & book on Wood, Fiberglass & Metal.

In California PLEASE add 4% tax on all orders.

AUTOBOOKS 2708 B Magnolia Boulevard BURBANK 9, CALIFORNIA

Ferrari D50

(Continued from page 37)

The portable gas-operated hot air blower was switched off and wheeled away from the tail, where it had been warming the rear-mounted oil tank with the engine whirring at a steady 2000 rpm. Then a brief shutoff while sixteen cold plugs were twisted into the V-8, followed by a restart with the portable motor and shaft which plugs into the left *rear* and mates with a driveshaft extension. Now aboard, with only head and collar showing in the compact cockpit, Ascari booted the D50 Lancia down the access road, its deep exhaust note coughing and sputtering in the low starting gear. Clicking in the synchronized second Alberto laid on it hard and all eight came in with a racketing blare that was to become very familiar in the next four years. With the blue hat and red car dwindling down the runway, work had just begun.

Jano had outdone himself with the D50, which was a fine-strung violin of a car and as such needed lots of tuning. Its literal heart was and still is a 90 degree V8 of 2½ liters capacity to suit the current Formula I. The derivation from the sports-racing Lancia is very clear in such matters as the chain drive to the cams — unique among Grand Prix cars — in which the double-roller chain for each head runs straight across between the two cam sprockets, and then over an adjustable idler placed just below the left-hand cam sprocket of each bank. This is similar to the layout used in current Alfas and in the new touring 3.5 liter Maserati engine, but differs from the 3.8 Ferrari twelve and the Beavis Offy, which bend the chain around an idler just between and below the cam sprockets.

Another link to the B24 Lancia is the cylinder head structure. There's a deep external web crossing between the cam boxes just above the center of each combustion chamber, in both cases. Right between each cylinder there's a stud going down into the block, and there are eight more studs along each side of the detachable head which effectively give six studs surrounding each cylinder. In common with several other current engines the Lancia has wet liners inserted in a one-piece block and crankcase, but the detail design is brilliant. In the first place, the water jackets of adjacent cylinders are completely separate except for a cross passage at the top just below the head face. The jackets are structurally joined by two planes of fore-and-aft webs, and are tied to the crankcase by lateral webbing.

Secondly, a wet liner must be sealed at both top and bottom of the water jacket, which most such engines accomplish by fitting gaskets to flanges at top and bottom and compressing the whole liner with cylinder head pressure. Not so Jano, who wanted to avoid any chance of liner distortion. The top of his liner has a flange which meets the cylinder head (then through a gasket) like most others, but just ¾ of an inch below the top is a shaped and notched flange which butts up against a counterbore in the cylinder casting. Between these two flanges, right at the top of the liner, all the stress of the cylinder head seal is absorbed. From this point down the liner only has to guide the piston, takes no compression stresses. Seal at the bottom of the Cylinder is assured by a close fit plus two synthetic rings grooved into the liner.

The above meant that the liner walls could be thin, for light weight and high heat transference. Water speeds and jacket capacity are low to keep temperatures up and wall friction down, the coolant coming in through manifolds low at each side and exiting through ducts alongside the intake valve seats. Distribution of water in the heads is very good, with flow all around all the valve seats and a wet, finned section of the exhaust valve guide. The water pump itself is driven from a small gear train at the nose of the crank, and has an integrally-cast duct to the cylinder manifolds. Mounted vertically just ahead of the front suspension assemblies, the radiator is thick-cored and has integral top and bottom tanks. Its outside shape conforms very closely to the cross-section of the body at that point, which gives it considerable area — perhaps more than other comparable GP cars. The same criticism was made of the first sports-racing Lancias. Space is so scarce up front that there's no room for air ducting away from the core.

Each cylinder head and its joint seal is treated as a unit in itself, the water jackets acting only as structural supports. The crankcase is a third design unit. The bottom of the block is machined off on the centerline of the crank, like a Jag, and the five mains are backed up by deep, thick webs. Block and heads, by the way, are cast in an aluminum alloy with a high silicon content, which improves castability in small, thin sections and increases durability under vibration.

Main bearing caps are about the heaviest yet thought up. Each one has two big studs close in and two smaller ones farther out which anchor the webbed cap firmly to the block. All the strength of this bottom end is in the block and main caps, plus the often underestimated contribution of the machined crankshaft. The low rotational moment of a V8 crankshaft is already a boon to responsiveness and acceleration, but Jano's version, with metal dispersed only where absolutely essential, set a new standard for the type.

With all this stiffness the Lancia D50 engine's sump could be just that — a collector for oil to feed the dry sump system. The big scavenge pump is mounted low down at the front, sucking oil through a series of collectors hung from the main caps. An oil reservoir is in the tail end of the car, as mentioned, and a core-type oil cooler was mounted in the front of the left-hand pontoon with a scoop on the outboard side. The pressure oil pump body is offset to the right of the crank nose and is integral with the top of an oil filter housing.

In contrast to some of the other Italian machinery that we've looked at lately, this Lancia engine has practically no external pressure oil feeds. Main artery of the lubrication network is a gallery the size of your thumb which runs from front to

back of the block right in the center of the vee. Each main is fed by a short duct down through the web. Passages up through the water jackets and head joints feed ducts drilled across the heads, which in turn deliver pressure oil to the camshaft bearings and valve mechanism.

There are a lot of practical features in this engine to make week-to-week teardowns easier. The detachable head is handy, for example, and to take full advantage of this two-bolt rod big ends are split diagonally so they can be pulled up through the cylinders.

The original pistons were high-domed with full skirts which carried five rings each — one below the big wrist pin. Heavy ribs under the crown curved down to carry loads to the wrist pin bosses. Very shallow cutaways for valve head clearance show unusual confidence in the valve gear! And with good reason, right up to the designed limits of the engine.

Early prototype editions of the D50 had long slim fingers separating the cam and valve stem end. Hairpin springs were fitted to keep the stems short and valve weight down, but this arrangment, while good of its type, was still too heavy for the exacting Jano. During development in 1954 the fingers were dispensed with once the rest of the engine was proven, and Vittorio inserted the compact type of tappet that he first developed for Alfa Romeo. With this the simple mushroom-type tappet is screwed directly to the valve stem, in some versions with a surrounding collar for extra security. Valve clearance is easily set by rotating the tappet in relation to the valve, and locked by a series of notches under the pressure of the coil valve springs. Adaptations of this system are now appearing on the Ferrari Formula II V6 and 3.8 liter sports V12, to no one's surprise.

Only after the later valve gear was adopted did the cars show enough speed to be competitive, and in their first few races there was a spate of bearing trouble. Nothing is more precarious than the balance between power and durability in a racing engine.

Thanks to the detachable head, there are no mechanical restrictions on the valve dimensions, which are big by any standards. Stems are hefty and the heads are deeply tuliped, diameters being 1.81 inches for the intake and 1.75 for the exhaust. Both have seat inserts. Both are also angled at 40 degrees to the cylinder center line, the intake valve stem being nearly an inch longer to allow plenty of room for a big smoothly-curving port from the carbs.

Early drawings show very special Weber carburetors with throttle bodies angled just right to mate with the Lancia intake ports. These carbs were actually built but didn't deliver the goods so an ace Solex salesman came to the rescue. The D50's made their debut with four twin-throat Type 40 PII Solexes fed by a seemingly small fuel line network down the center of the group. Among other little touches, carburetion development made use of a finned, temperature-pickup bulb placed high between the two rear carb intakes, where underhood air would be at its hottest. Air came in through a duct recessed

continued on next page

B-A-P

One of the World's Largest Distributors of Foreign Car Parts

BRITISH AUTO PARTS

BORG & BECK *The perfect Clutch*

Lockheed hydraulic brake parts

Remax ELECTRICAL PARTS

LUCAS BULBS GENERATORS

Thompson TIE ROD ENDS

JOHN BULL RADIATOR HOSE fan belts

ARMSTRONG SHOCK ABSORBERS

GIRLING

PUROLATOR

TRANSVALVE steels

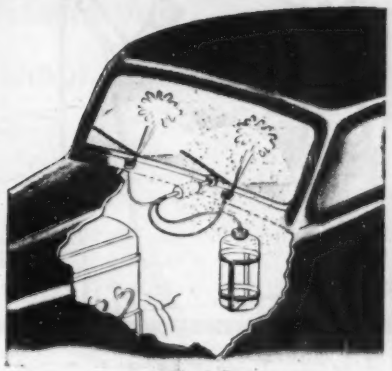
Wingard UNIVERSAL WING MIRRORS

LODGE

HUTH EXHAUST SYSTEMS

MINTEX BRAKE LINERS

COVMO PISTONS Rings & Pins



WINDSCREEN WASHERS BY TUDOR

HAND or FOOT CONTROL install it yourself!

No more dirty, dangerous windshields. The Tudor screen washer is different. Press the plunger and instantaneously the jets will emit spray for the wipers to make a CLEAN SWEEP. No connections are necessary to the manifold or battery unit as it is completely self contained. Unbreakable polythene, rattle proof container. Precision parts on plunger assembly and jet swivel adaptor. Standard equipment on 25 British & Foreign Cars. Everything is supplied for perfect installation.

FOR ALL AUTOMOBILES

Perfect for VOLKSWAGEN, AUSTIN, HEALEY, TRIUMPH, MG.

OR SEE YOUR NEAREST DEALER

ORDER BY MAIL COMPLETE only **$7.25**

MGA — $ 8.25

1957 BAP CATALOG

96 pages — Parts and Tool lists. Data Sheets and accessories. Only $1.00 Money back on 1st order.

Distributed in the U.S.A. By
BRITISH AUTO PARTS
NEW YORK—47-19 34th Ave., Long Island City
SAN FRANCISCO, CALIF.—530 Golden Gate
SEATTLE, WASH.—605 E. Pike

ASSOCIATE DISTRIBUTORS
CHICAGO, ILL.—S. H. Arnolt, 2130 N. Lincoln Ave.
BIRMINGHAM, ALA.—Southeastern Imp. Parts Co., 219 South 21st St.
SEND TO NEAREST DEALER

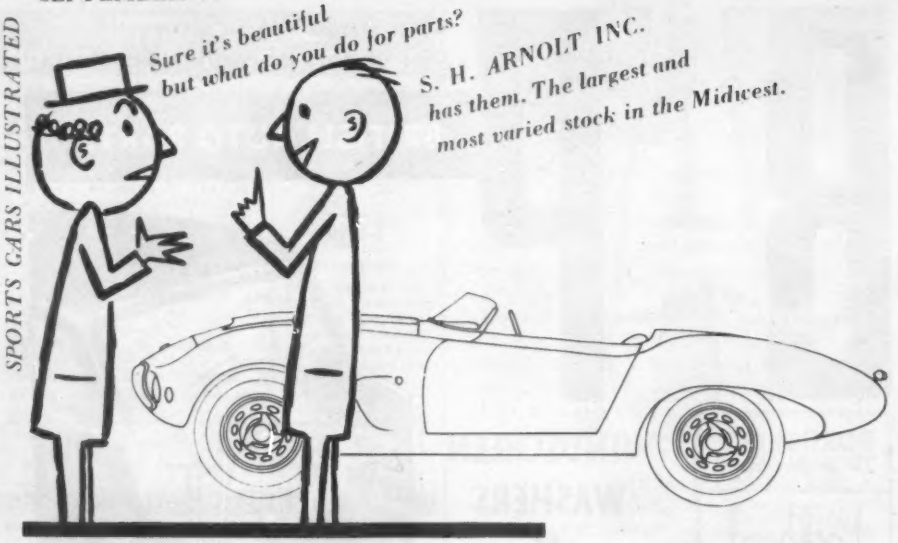
Enclosed please find $1.00 for the 1957 BAP Catalog—on my first parts or accessory order please refund $1.00.

NAME_____

ADDRESS_____

CITY_____ STATE_____

NO C.O.D.'s PLEASE



Complete Parts Service for:

MG* • MORRIS MINOR 1000*
AUSTIN* • AUSTIN HEALEY*
MAGNETTE* • ROLLS-ROYCE
BENTLEY • RENAULT • JAGUAR
HILLMAN • SUNBEAM

*P.S.: ARNOLT CORP. has just been appointed official engine rebuilding agency for all British Motor Corp. Cars.

S. H. ARNOLT INC.
CHICAGO SALONS:
153 East Ohio Street • 5840 North Broadway
PARTS AND SERVICE CENTER:
2130 North Lincoln

RACE and RIDE with PIRELLI TIRES

Experienced riders rely on PIRELLI to give them the winning margin in races, gymkhanas and rallies. When you equip your car with PIRELLI you will notice the difference in better roadholding especially on wet surface. Your local dealer stocks PIRELLI.

COLUMBIA MOTOR CORP.
419 East 110th St., New York 29, N. Y.

NEW 1957 CATALOG! AVAILABLE SOON

50 pages — 10,000 Items.
Bigger and Better, complete Coverage of all manufacturers. Plus any and all Special Equipment for New Models — MANY heretofore unlisted items — from wheel discs to fuel injection.
Send your $1.00 today — refundable on first purchase.
HILDEBRANDT • CRAGAR • EDELBROCK
HILLBORN • OFFENHAUSER • WEIAND
HALLIBRAND • HARMON & COLLINS
SCINTILLA VERTEX

Mercedes Benz Grand Prix (W196) Construction Kit $1.95

Made in England. Measures approx. 6-1/2 inches to scale. Heavy plastic. Easily assembled with parts, racing numbers and cement provided. Only tool needed is a pair of scissors. Also available new, "D" Type Jaguar and Aston Martin DB 3S kits at $1.95 each. Other kits to follow soon: G. P. Connaught, Lotus Mk II, G. P. Ferrari, G. P. Vanwall, Cooper 500 Mk 9, G. P. Maserati.

Send remittance of $1.95 to: Dept. 9, R. GORDON & CO., Inc., 32 E. 59th St., NY 22, NY

Be an industrial designer

Combine your design abilities with technical aptitudes in Industrial Design training at Art Center School. Work under practicing professionals for top jobs as automotive stylists, product, package designers. Design stores, motels, showrooms, shopping centers. Constant demand for graduates. 700 students. Accredited. 4-year course can be completed in 2 yrs. 8 mos. by year-round study. New terms Feb., June, Sept. Co-ed. Enroll early. Write Mr. Shea. 5353 West Third Street, Los Angeles, Calif.

ART CENTER SCHOOL

Ferrari D50

continued from preceding page

in the top of the snout, instead of a conventional scoop.

Twin Marelli magnetos are driven off the back ends of the intake cams and protrude through the firewall into the cockpit. The first prototype car had two little cowl air scoops — one to cool each mag — but anticipating rain the later cars had a shuttable square scoop in the center.

At the back of the V8 is nothing but a small cover for oil sealing and a direct connection to the driveshaft which, like the engine, is angled from right front to left rear of the chassis to allow a low profile. The transmission is right behind the driver and all its shafts plus the integral differential are aligned *across* the car. As viewed from the side the case leans back at a 45 degree angle. The input or countershaft is at the bottom, the mainshaft at the center, and the spur-driven differential is at the top and farthest to the rear. At the left of the beautifully-ribbed case is an integral housing for the dry, multi-plate clutch which drives the countershaft. The clutch cover plate houses a pair of bevels which take engine rpm from the drive shaft, and which have an extension for the starter that we mentioned.

The box has five forward speeds with first mainly for starting. Porsche synchro is used on the top four gears, and it's likely, as in the case of the Bugatti GP car, that this included the valuable help of the Porsche design staff in laying out the bearings and shafting. Gears are selected with a gateless lever on the right hand side which first did its job through one rod, but later had a second one added. There's a hydraulic cylinder for the driver's left foot, just like the one on the right for the binders. It kicks open the clutch via a small slave cylinder at the rear which tugs the withdrawal lever against a coil spring in tension.

The section of the casing for the differential is exceptionally large, to prevent pressure buildup and allow a wide range of ratios. A ZF-type differential is used. To answer a few questions, this is a device which uses sliding cams instead of pinions to balance forces between cammed surfaces instead of axle bevels. The eventual effect is the same with the exception that the cams slide with such friction that some torque is always transmitted to both wheels.

In this case the torque goes to the wheels through U-jointed half-shafts which, like the drive shaft, are remarkably small in diameter. Both universals are simple Hooke-type and length changes are catered for by sliding splines which ride on ball bearings to reduce friction. Otherwise you get an uncontrollable amount of suspension damping.

TO BE CONCLUDED
NEXT MONTH:
FULL CONSTRUCTION DETAILS

Indy

(Continued from page 41)

A pair of unusual Kurtis creations which can be regarded as on the fence as far as future possibilities are concerned are the Bardahl Spls., property of Memphis, Tenn., trucker Pat Clancy. Clancy ordered his cars with their engines mounted on the right side instead of the left. His argument behind this design is that the weight already is jacked from the left rear to the right front wheel in attempting to get proper weight distribution. Thus, why not put the weight on the right side to start with, and thereby get away from the necessity of putting so much twist into the frame.

Whether his ideas had a fair test is open for debate. Both cars qualified in the 140-141 mph. bracket, and the one driven by Jack Turner finished in 11th place. Al Kellef, though, ran out of luck and leaned Mr. Clancy's pride and joy against the outer retaining wall. He later reported the front end just went out from under him and there was nothing he could do about it. Even Turner said he was geting some romance, the car tending to pivot to the left. All this reaction would indicate the bugs connected with a right hand mounting have not been conquered.

Every year a few legitimate mechanics come to the Speedway with engineering concepts that have good basis for trial, yet for one reason or another never get the job done. A couple of teams falling into this category were the Wolcott Fuel Injection Spl., and the Helse Spl.

The Wolcott car departed as much from standard as did Hanks' winning combination. The engine was a 165-cubic inch four-cylinder supercharged Meyer-Drake set in the chassis at a 13-degree angle from centerline. Drive was taken through two universal joints, with the driveshaft passing to the right side of the driver instead of the left as is usual in roadster construction. A torque arm, connected at one end to the center section of the quick change gear box and at the other to a ball socket on the frame, was installed to take up the torque reaction and eliminate driveline whip.

This operation had headaches they hadn't even used, as the constant failure of the constant velocity U-joints limited any one practice run to but a few laps. Excess heat due to friction in the joint caused the repeated breakdowns, and was solved only by the substitution of Spicer truck joints. After that, the car had an opportunity to work out, and gave the mechanic, Herb Porter, an opportunity to grapple with the problems attenuated with supercharging.

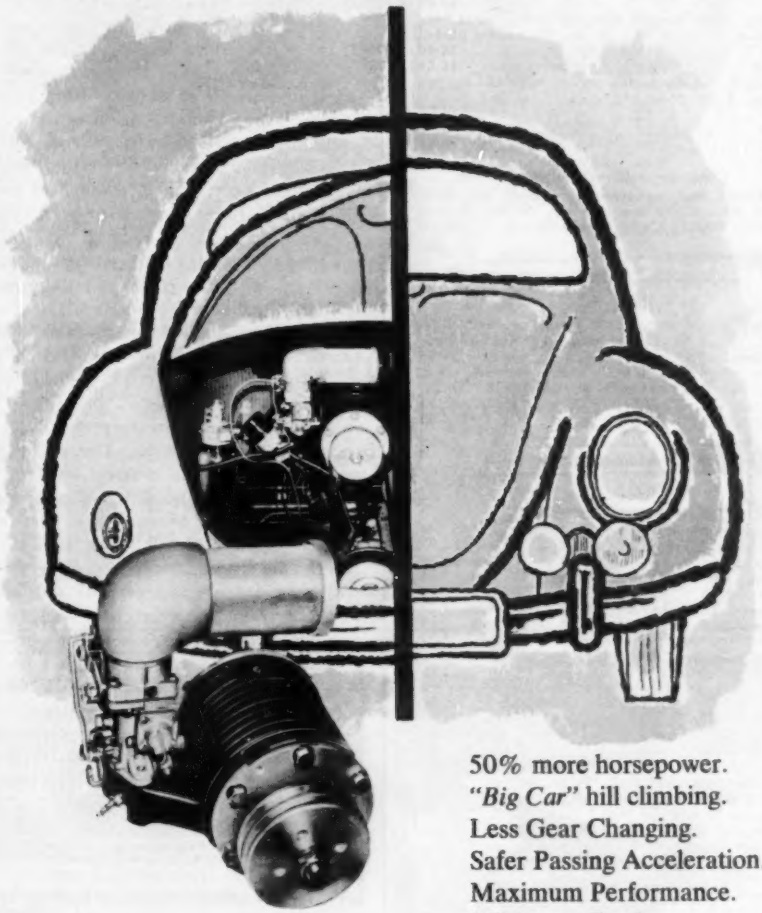
Porter has evolved an injector arrangement which injects fuel directly into the manifold intake port instead of carbureting it through the blower. He has built a pressure feed system which provides the correct amount of fuel/air ratio on acceleration, and dumps it overboard on deceleration so the engine does not load up on the overrun. The system was working well, with Rodger Ward working his way up through the field when a bearing failure in

continued on next page

THE OTHER HALF

A JUDSON SUPERCHARGER
For Big Car Performance

Every VOLKSWAGEN should have one



50% more horsepower.
"Big Car" hill climbing.
Less Gear Changing.
Safer Passing Acceleration.
Maximum Performance.
Minimum Cost!

THE REAL EXPERTS SWEAR BY IT!

They are the Volkswagen owners who have experienced this new driving thrill for thousands of miles. A JUDSON SUPERCHARGER will give your VW "Hair-On-The-Chest" performance. Easy, bolt-on installation, no sacrifice in reliability or economy. Thousands in use throughout the world. Complete "Do-It-Yourself" installation kit only $144.00 f.o.b. factory.

Clip Coupon . . . Mail today for complete information about this revolutionary new supercharger. (Dealers: A few choice protected territories are still available. Write for franchise information on your letterhead.)

MAIL COUPON TODAY FOR LITERATURE

Please send me complete information on the Judson Model VW supercharger installation.

NAME..... SC-9

ADDRESS.....

CITY..... ZONE..... STATE.....

JUDSON RESEARCH AND MFG. CO., CONSHOHOCKEN 3, PA.

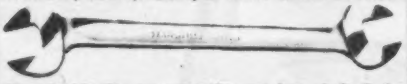
STAHLWILLE TOOLS

Whitworth size—Set of 4 Stabil End wrenches, drop forged Manganese-Silicon steel, Nickel plated. 1/8 to 9/16 W.....$3.20
Set of 4 Stahlwille Motor End wrenches, fine mechanic's quality, drop forged Chrome Alloy steel, Chromium plated. 1/8 to 9/16 W.....$5.45

Set of two short 15° offset Box wrenches, 5/16x 1/4W and 5/16x3/8W, 12 point.....$2.50
Set of three short 30° offset box wrenches, 1/8 x 3/16W, 1/4x5/16W, and 3/8x7/16W, in plastic kit $5.80
Sockets, drop forged Chrome Alloy steel, hot broached 12 point, 3/8" sq. dr., Chromium plated Set of 5, 1/8 to 3/8 Whitworth.....$4.66
Tappet wrench 5/16x1/4W.....$1.58
Whitworth Combination Wrenches of Forged Chrome Alloy Steel, 12 point box end.

1/8 W	$1.12	3/8 W	$2.54
5/16 W	1.82	7/16 W	3.19
1/4 W	1.99	1/2 W	3.66
5/16 W	2.36	9/16 W	3.82

METRIC END WRENCHES
Five Stabil End wrenches in plastic kit, drop forged Manganese-Silicon steel, Nickel plated, 6x7, 8x9, 10x11, 12x14, & 17x19 mm.....$3.20



Five Stahlwille motor end wrenches, 6x7, 8x9, 10x11, 12x14, & 17x19 mm, chromium plated, in a metal clip.....$4.95
Twelve Stahlwille Motor end wrenches, 6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 25x28, 27x32, chromium plated in a metal clip.....$17.35

METRIC COMBINATION WRENCHES
Forged Chrome Alloy steel. Chromium plated. Set of 4 Midget Combination, 4, 4.5, 5, 5.5 mm..$4.07

6 mm..	$1.05	11 mm..	$1.59	16 mm..	$2.36
7 mm..	1.05	12 mm..	1.82	17 mm..	2.36
8 mm..	1.12	13 mm..	1.82	18 mm.	2.36
9 mm..	1.12	14 mm..	1.99	19 mm..	2.71
10 mm..	1.49	15 mm..	1.99	21 mm..	3.19
				22 mm..	3.19

Metric box wrenches, short handle, 15° offset, 6x7, 8x10, 9x11, 12x14, & 17x19 mm.....$4.95
Metric box wrenches, long handle, 75° offset, alloy steel chromium plated, 12 point openings, 6x7, 8x9, 10x11, 12x14, 17x19, 20x22, 21x23, 24x26 & 27x32 mm.....$23.30
Sockets, eight most popular sizes, 9, 10, 11, 12, 14, 15, 17, & 19 mm, 3/8" sq. dr. 12 point..$7.31
11 sockets, all sizes 9 to 19 mm, 3/8" dr.....$9.98
Set of 5 Deep Sockets, 3/8" dr., 12 point, 10, 12, 14, 17, & 19 mm.....$7.57
Sockets, 1/2" sq. dr., drop forged Chrome Alloy steel, hot broached 12 point. Chromium plated, 10 to 13 mm....$ .93 ea. Black finish 20% less.

14 & 15 mm....	1.01 ea.	26 mm.....	$1.48
16 mm.....	1.04	27 & 28 mm....	1.70 ea.
17 to 22 mm....	1.19 ea.	30 mm.....	1.81
23 to 25 mm....	1.44 ea.	32 mm.....	1.92

Inhex sockets, 1/2" dr., for Allen-type bolts on German cars, 5, 6, 8, or 10 mm.....$1.50 each
12 mm Inhex socket, Simca drain plugs....$1.87
14 mm Inhex socket, Mercedes drain plugs $2.09
DB 8 mm, rocker arm stands on Mercedes, $2.11
DB 10 mm, Mercedes, Porsche, VW head $2.53 ea.
36 mm 3/4" dr. Socket for VW rear hub $3.05 ea.
Uno wrench, a 17 mm box wrench with built in magnet which fits the upper two engine mounting bolts, enabling one man to easily remove Porsche or VW engine.....$3.87
Thin single ended 27 mm wrench for Porsche & VW front spindle nuts & steering gear, $1.60 ea.
Transporter spindle nut wrench, 32 mm....$2.10
VW & Porsche fuel pump wrench 14 mm #1032 $5.98
Oil Cooler wrench 10x14 mm #1025.....$3.10
Oil pressure switch wrench, 27 mm #1033 $6.35
VW sparkplug socket 1/2" dr. #10512.....$3.50
VW or Porsche oil drain socket, 1/2" dr....$2.20
End wrench with one jaw set at 75° angle, can be used to remove Porsche carburetors, 12 or 14 mm.....$1.32 each
Metric feeler gauge, 6 blades about 3" long, 0.10, 0.15, 0.20, 0.25, 0.30, 0.40 mm.....96c
Goggles, German import, similar to Army B-8 type but especially made to fit over eyeglasses. Rubber frame with Clear, Amber, and Green interchangeable lenses $4.35

Minimum order $3.50 please. Prices incl. postage
Add 4% Sales Tax in California
DEALER INQUIRIES INVITED

Louis B. Pierlot • P.O. Box 346
Inglewood 5, California
Street address: 1010 South Fir Ave.
ORchard 7-0923

Indy

continued from preceding page

the blower drive put him out of the race.

Jimmy Daywalt's Helse Spl., was the victim of a month long controversy over a four pipe exhaust stack. According to the rules originally drafted by the old AAA contest board, the pipe had to extend past the driver's compartment so as not to constitute a safety hazard. The Helse car had four individual stacks coming out the left side of the hood, and then curving outward just ahead of the rear tire. Actually, it merely was a modification of the motorcycle boy's tuned exhaust.

Aside from having a strange blatting sound, the only real objection was the air blast might hit a driver running alongside Daywalt during the race. USAC officials weighed all factors of this setup, and finally modified the rules to permit the pipes to remain on the car.

A development Helse mechanic Bruce Crower brought along that didn't meet any objections was a triple carburetor induction system mounted on a log type manifold. Crower is in the manifold manufacturing business in San Diego, and does not necessarily hold a deep love for fuel injection, though he did end up running his own version of fuel injection when the chips were down. The triple carbs worked on a timed feed principle, with a spring loaded plunger controlling the fuel flow. The San Diego inventor took Bendix castings, removed the metering jets, and created his own metering system which always had a proper fuel/air mixture as dictated by engine requirements.

Crower's fuel injectors fundamentally followed the trail blazed by Stu Hilborn, with one important exception. Three injector nozzles were used instead of one. The induction tube was lengthened considerable, and the nozzles interspersed along the tube. This method achieved better fuel/air homogenization and cut down on the fuel loss. The Meyer-Drake's straight-through porting and tremendous valve overlap tends to suck unburned portions of fuel out into the exhaust ports.

What happened to the Novis is an enigma. There are not a few who believe their teeth were pulled to make them go the distance, because neither seemed to have the steam displayed during the practice session when Russo set a one lap qualifying record of 145.255 mph. for the new formula. In regards to Tony Bettenhausen's machine, the reason was most obvious. A segment of the throttle linkage fell out of its mountings and prevented the throttle from being opened to its fullest extent.

Russo's V8 may or may not have been "de-smoked." The engine is about the same as last year, except a new crank was ground to bring the displacement down to 169-cubic inches. Information is as hard to obtain from this bunch as getting gold out of Fort Knox, but the grapevine had it they were pulling 130-inches of mercury. While that is possible with single stage centrifugal supercharging, it also would be the reason mechanic Jean Marcenac was burning the

(Continued on page 66)

DON'T GET CAUGHT with your RESERVE DOWN, install a
RESERVE REMINDER
on your V-W now.
$3.95 complete
Kit includes light switch and directions
15 Minute Installation • Money-Back Guarantee
At Your Dealers or Order Direct
AUTOHAUS ACCESSORIES
P. O. BOX 41, MADISON 1, WISC.

Jahns
QUALITY PISTONS
The nation's oldest and foremost manufacturer of custom and stock aluminum racing pistons
ALL TYPES — ALL SIZES
Write for **FREE** literature
Factory: 2662 Lacy St. Dept. S CApitol 5-8177
Los Angeles 31, Calif.

TONNEAU COVERS
• Corvette • Thunderbird

• Mercedes 190 SL • Porsche • Alfa Romeo
• MG • Jag and most popular sports cars
• Late model American convertibles
• Highest Quality • Custom Styling
ROBBINS AUTO TOP COMPANY
1453 Lincoln Blvd. S-6
Santa Monica, Calif. Ph. EXbrook 5-9174

Sports Car Owners!

JARDUR — A Water-Resistant, Shock-Protected, Chronograph, precision-built and designed for all your timing requirements.
At your local dealer.
Send for catalog.
Jardur Import Co., 874 B'way, New York 3, N. Y.

Metal Flag Medallions

American • British • German • French • Italian / $1.50 ea. $2.50 pr.
Full color chrome and enamel fits hood or other metal size 1¼" x 2", ready to install. Send 25c for Fully Illustrated Catalog of Emblems, Jackets, etc.
STYLIZED EMBLEM COMPANY
DEPT. S 1872-S N. Wilton Pl., Hollywood 28, Calif.

Minx

(Continued from page 43)

setup pilfering as much as 8 miles per hour. It was right and proper to time the car with the cleaners in place, of course, but an owner contemplating the milder forms of competition work, or merely desirous of having an impressive answer to wottle-she-do-mister catechisms, would possibly be willing to put up with the power roar released by open intakes.

So on balance it is probably fair to conclude that a converted Minx in top condition would make a genuine 90, or anyway closely approach it, as a mean of opposite direction runs.

As regards our acceleration figures, the bijou wallop produced by the aforesaid flat spot probably did not worsten the times, for the simple reason that the revs never were low, least of all in the moment of mechanical sadism immediately preceding the drop of the metaphorical hat.

Conversion by Alexander, in this Minx context, is a three-way deal, each element being separately listed and priced. Basic item is the engine treatment already described. Secondly, for customers who want it, they add Laycock overdrive, operating on third and fourth gears, as a supplement to the regular four speed transmission. Thirdly, again at option, you can have a central shift to replace the standard column change. As a photo shows, the substitute lever is of the wand type, not a short remote controller.

The car tested had all three offerings, the presence of the overdrive making Rapier comparisons the more valid because Sunbeam standardises this delightful Laycock equipment. But whereas direct drive on the Rapier (5.22 to 1) is pitched to enable full power to be developed in overdrive high (Ludvigsen's best flying quarter was recorded in O.D.), Alexander leaves the Minx axle ratio where it was at 4.78 to 1; so even with its big extra helping of power, the converted Minx is faster in direct drive than O.D.

Test results proved this policy sound. In some cases where overdrive is grafted onto an existing train, one or other of the bonus ratios is found to coincide too closely with a basic gearing, so that certain fingerings produce virtually no benefit. With the Hillman this isn't so. At 60 mph, for instance, the respective engine speeds in O.D. third and direct drive are 4200 and 3700 rpm.

If it's true, as some students maintain, that overdrive yields its fullest value when allied with a three speed box, then Hillman and Laycock, paradoxically enough, make an ideal couple. This is because the Minx's first gear, 17.05/1 overall, is an emergency ratio, the same as on the Rapier, so that in everyday use this virtually is a three speeder. Second not only takes the car off the mark comfortably and without need of clutch jugglery, but also, with the help of more than seventeen extra horses, hits peak on this gear with almost disconcerting rapidity. But following the

continued on next page

IT'S AN MG!

. . . with a DEVIN fiberglass body

MG, Healey, TR, Fiat, Volkswagen, Morris, Crosley, Hillman. . . . and many other light car chassis can be used to build a hard-charging sports car for street or competition using the *immediately-available* DEVIN body. Nine wheelbase & tread combinations plus available "extras" such as headrest, cockpit liner, etc. make the Devin the outstanding kit on the market. Beautiful lines, superb finish and ease of installation have satisfied hundreds of customers. *Call or wire Bill Devin today and begin building the special you've dreamed about.* Or, write for name of dealer nearest you. All Sizes: $295 F.O.B. Lancaster, includes F.E.T., trimming and crating. C.O.D. deposit 20%.

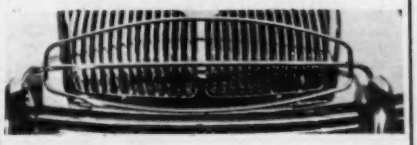
BODY	W.B.	TREAD.	FITS
A	78"-82"	40"-44"	Crosley, Fiat
B	82"-86"	40"-44"	Hotshot, Fiat
C	86"-90"	40"-44"	Class G&H Spl.
D	82"-86"	45"-48"	Simca, Renault
E	82"-86"	48"-52"	Panhard sedan
F	86"-90"	45"-48"	TR2 TR3
G	86"-90"	48"-52"	Healey
H	90"-94"	45"-48"	MG TC
I	90"-94"	48"-52"	MG TD-TF VW

(I also fits our tube frame chassis using OHV V8's)

DEVIN ENTERPRISES
44500 Sierra Highway
Lancaster, California PHONE: WHitehall 2-4719
Builders, National Class Championship Sports Cars

DEVIN

NOW READ THIS!!
M. G. A. Owners



1. Complimentary sports car designed grille Guard. ©
2. Conforming contours of bar steel (no tubing).
3. Guaranteed heli-arc welded.
4. Triple plate (copper-nickel-chrome).
5. No dismantling or drilling car.
6. 15 minute installation (save $8.00-$10.00 labor).
7. A real value at $22.75.

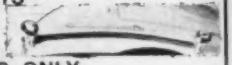
DEALER INQUIRY INVITED

Available for ALL Cars
Full Sphere Shift Knob

- Lightweight - Comfortable.
- Fast ball bearing action.
- Internal threads (no rubber sleeve).
- Beautiful bright silicone finish.
- 1½" (3.5 oz.) or 1⅞ (5 oz.) diameter—$2.25.

Price includes tax and postage—No C.O.D.

PLEXI-WIND SCREEN AND BRACKETS
9.50
(⅛" x 8" x 16")



BRACKETS ONLY
per pair **5.50**
(Make your own screen to desired length and shade)

MULTI-PRODUCTS CO.
5054 E. ALHAMBRA AVENUE
LOS ANGELES 32, CALIF.
CA 3-1186

For the Sport Car Owner Who Demands the Best!

IT'S CONCOURSE-OF COURSE
NEWLY LOCATED IN PALM SPRINGS, CALIF.

At last - a compact
TOW CABLE!
6 ft. steel tow cable that comes in a 6" x 2" metal container. Uses no snaps, bolts or nuts. Hooks hold on by own weight. 4,400 lb. test. Perfect for the small car.
$4.95 each.

MGA WINDWINGS
Formerly $15.95. Now the sensible price of $11.50 per pair. Ready to put on. MG-TC, TD, TF — Still $9.95 Illustrated.

The SPORT CAR SCARF
The gals will love it! Your car emblem on back. Reversible jersey. Head band sewn in to hold at all speeds. Blue, Red, Black, White. Give car make. **$2.95** each.

Free catalog on request

Everything Post paid except C.O.D.'s
Calif. res. add 4% tax.

CONCOURSE
DEPT. A5 - P.O. BOX 788
PALM SPRINGS, CALIF.

SPORTS CAR OWNERS

PATENT PENDING

CARRY YOUR LUGGAGE
(Fits MGA, Austin Healey, Triumph, Corvette & T-Bird)

- IDEAL FOR WEEK-END EXCURSIONS OR THAT "TWO WEEK VACATION"
- COMPLETELY REMOVABLE
- NO HOLES TO DRILL
- CAN BE MOUNTED & REMOVED IN SECONDS
- SITS ON FOUR LARGE, RUBBER SUCTION CUPS
- HELD IN PLACE BY FOUR EASILY ADJUSTED, STAINLESS STEEL STRAPS
- APPROXIMATE SIZE—20" x 30"
- CONSISTS OF A HEAVILY CHROME PLATED, TUBULAR STEEL FRAME & FOUR STURDY, FINISHED HARD WOOD SLATS
- PLEASE STATE MAKE & YEAR OF CAR IN ORDER

$24.75

MOUNT YOUR FRONT LICENSE PLATE
(Fits MGA Only)

- MEETS CALIFORNIA & OTHER STATES' REQUIREMENTS
  License plate must be at least 12" from the ground
- DRAG-PROOF
- BOLTS RIGIDLY TO THE FRONT BUMPER
- NO HOLES TO DRILL
  Uses the same mounting holes as the British bracket
- RUGGED ONE PIECE CONSTRUCTION
- MADE OF HEAVY GAUGE ALUMINUM
- CUSTOM DESIGNED FOR THE MGA

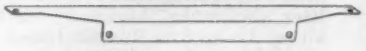
$1.75

DEFEND YOUR GRILLE
(Fits MGA Only)

- BOLTS DIRECTLY TO THE FRAME
- NO HOLES TO DRILL
- RUGGED ONE-PIECE CONSTRUCTION
- EXCEPTIONALLY STRONG
- "CUSTOM QUALITY" CHROME PLATED
- MADE OF 1" DIAMETER, EXTRA HEAVY, STRUCTURAL STEEL TUBING
- CUSTOM DESIGNED FOR THE MGA

$18.75

PATENTS PENDING



LICENSE PLATE MOUNT

ACCESSORY ENGINEERING
P. O. BOX 415, MANHATTAN BEACH, CALIFORNIA
Dealers Inquiries Invited

Prices Includes Postage
Add 4% Tax in Calif.
Sorry, No C.O.D.

VOLKSWAGEN ROAD EMERGENCY KIT

Here's insurance against trouble anywhere, anytime. Kit includes: Distributor points, rotor, cap brush, condenser, generator brushes and 2 spare fuses plus original VW wiring diagram. Complete kit $4.95 ppd. Kit plus 4 Bosch spark plugs $8.50 ppd. **Send year and model,** please no COD's.

JOE HUNT
Hq. for German Bosch electrical equipment
2600S W. VERNON AVE., LOS ANGELES 8, CALIF.

INTERNATIONAL DRIVING PLATES

Authentic, Imported International Vehicle Identification. Solid aluminum—black letters on white background. Letter "D" signifying West Germany also available—immediate delivery $2 each—2 for $3 postpaid. Money back guarantee. Send cash, check or money order to:

CONTINENTAL TAGS, 22 Chester Dr., Yonkers, N. Y.

THE THIESSEN TOOL CO.
FOREIGN & DOMESTIC
Mechanics & Machinists Tools
Metric & Whitworth
Taps & dies, micrometers, etc.
2908 22nd STREET
SAN FRANCISCO 10, CALIF.

"SCOTTOP"
JAG XK 120 — XK 140

Scott Manufacturing Co.
485 RALEIGH AVENUE
El Cajon, California
PHONE HICKORY 4-2634

NEW!

2 Styles of Reinforced Fiberglas Tops
"Ranchero Sombrero"
Cab Level Top
"Ranchero Flatty"
Bed Level Top
Write For Information

HARDTOPS FOR SPORT CARS

20 lb. custom made fiberglass hardtop. No holes to drill or changes in body. On and off in one minute. Price includes plastic foam headliner in color of your choice. Drip moulding and stainless steel hardware. 12 x 36 inch rear window. Comes in any standard automotive lacquer or primer coat. Shipping carton.

PRICE COMPLETE FROM **$155.** F.O.B. SAN DIEGO

Also "Scottop" for: Corvettes '53-'57—MG — TD, TC, TF, & MG-A — Austin Healy — Mercedes Benz SL-190—Triumph TR-3.

continued from preceding page

shift into normal third, progression is markedly sedater.

In O.D. fourth, the Minx has an excellently long stride for its small displacement, feeling quite composed and relatively effortless when held at a corrected 70/72 mph for mile after mile. Alexander's position for the overdrive switch lever, just behind the wheel at around two o'clock, is unexceptionable, and a big improvement on some of the placings we know of. Too, the little toothpick lever itself is engagingly tweakable. One of Laycock's stock boasts is that you can make shifts either up or down on full noise and without touching the clutch. True, you can; going up, in fact, full power changes are smoother than part throttle ones, but personally we preferred to cushion our downshifts with a quick jab at the clutch.

Parenthetically, it is amusing to reflect how opposing schools of thought rate given transmission features as either boons or banes. For instance, Alexander's blurb on the Laycock installation declares pridefully that "no automatic control whatever is fitted, neither is any form of free wheel incorporated". The competition, on the other hand, throws a big chest about its semiautomaticity and freewheeling. No wonder the poor bemused layman motorist has a hard time telling right from wrong.

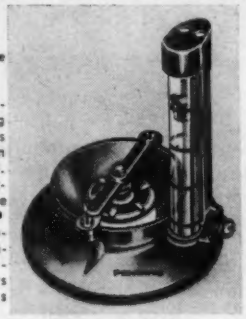
If it isn't laboring the obvious, the value of Alexander's floor gearshift, *vis-à-vis* Rootes' own column change, depends how badly the individual operator hates column changes. Here in Britain, the intelligentsia, real or self elected, unanimously execrate them. Speaking for ourself (intelligentsia, real) we have a preference for Alexander's central wand, which, being devoid of the haggis of linkages that are the concomitant of column shifts, can be relied on for lifelong consistency of response. A further merit of it is that it lends itself to shortening and relocation of the knob to suit simian types. The one fitted to the test car was experimental; production levers will be thicker and chromium plated.

As far as we could discover, the Alexander power pack incurs no penalties in other aspects of engine behaviour, except inasmuch as a driver who uses all the extra steam available will naturally go fewer miles per gallon of fuel than a stock Minx owner. Hot or cold, starting was instant and idling regular. On British middle grade gas, with an octane rating of around 88, the engine could not be made to pink. Over a wide range of operating conditions the coolant thermometer stayed around the 170°F mark, except immediately after switching off following sustained full throttle work; it then swung momentarily to the top limit of calibration (230°F) but the system nonetheless blew off no steam. The flat spot has already been dealt with, and this, it can be said with virtual certainty, would not be reproduced in marketed conversions.

continued on next page

NEW

Uni-syn Multiple Carburetor Synchronizer



Uni-syn, an instrument for balancing multiple carburetors of any type, down draft or side draft. • Sturdy construction • Positive float readings • • Fits all carburetor sizes • Enthusiastically recommended by users • No adapters needed.

No C.O.D.'s — Price ppd. $9.95
Royze Carburetor Gaskets kits available for all cars.

ROYZE Inc.,
Dept. II, 1509 Centinela Ave., Inglewood, Calif.
OR. 8-7032

SPORTS CAR COLOR SLIDES

Beautiful 35MM slides of outstanding cars and drivers. Featuring magazine cover pictures.

Set 6. Ferrari Monza, Austin-Healey-100S, A.C. Ace-Bristol. Set 7. Mercedes 300SLS Shelby 3 Litre Maserati Concourse "C" type Jag. Set 8. Maserati 1.5, R.S. Porsche Spyder, Conquest special. Set 9. 3 views of the new SS Jaguar.

Sets 1; 2; 3; 4; and 5 are still available
$1.50 per set of three ppd.
CARLYLE BLACKWELL STUDIO
2110 Laurel Canyon Blvd., Los Angeles 46, Calif.

HAMILTON MASTER WATCH

(Used) Limited Supply

22-Jewel precision pocket-size watch with large sweep second hand that can be synchronized for perfect timing. 24-hour black dial with white numerals. Case included. $60.00 plus 10% F. E. T.

FELDMAR WATCH CO.
Hdqs. for Rallye Equipment
8971 West
Pico Blvd.
Los Angeles 35,
Calif.
Free Catalog
Order by Mail

WOW! A Turner sports car for $1995.00, 40 mpg, 88 mph, 4 speeds forward, 950 cc engine, Austin A35 components, Class H Competition winner. Dealer inquiries invited. European Motor Mart, Importer, Distributor, Dealer. 121 North Bell Avenue, Springfield, Ohio, FAirfax 2-9591.

TOPTEX HELMET

TOPTEX *advanced protective headgear*
for automotive - aviation - motorcycle
TOPTEX, INC.
6521 WEST BOULEVARD
INGLEWOOD 3, CALIF.

Please Be Sure to Mention
SPORTS CARS ILLUSTRATED
When Answering Advertisements

Minx

continued from preceding page

With the lid up, the engine conversion adjuncts looked a bit of a teddy bears' picnic on the test car, mainly because of temporary choke cable enskeinments and the retention of a large bracket normally used to attach the stock Minx air cleaner. Here again, however, the guinea pig character of this particular machine must be taken into account. Michael Christie, Alexander's managing director, is himself a well known and highly successful hill-climb driver—he repeatedly placed second to Ken Wharton in the seasonal climb championships before Ken's recent and untimely death; Christie's racing cars (which this year, incidentally, include a Cooper powered by a unique 2.1 liter edition of the twin cam Climax) are always beautifully turned out, and his bent for tidiness is generally reflected in his company's wares.

Alexander makes no attempt to modify the Minx running gear in quest of road-ability to match 90 an hour performance; indeed, it isn't easy to see what they could do. In point of handling—and this bears out Ludvigsen's remarks on the basically similar Rapier—the car's least endearing quality is an exaggerated understeer and heaviness of the helm on tight turns and at low speeds. This being obviously the result of nose heaviness—57 percent of the unladen weight is on the front wheels—the best an owner can do is to develop his biceps and remind himself what a lot of body space he gets by virtue of far-forward engine location.

Neither the understeer nor the high twirl resistance has any effect on safety at speed in a straight line, of course, and in fact, the Minx is a perfectly stable and controllable vehicle under such conditions. Moreover, although hairy cornering produces a fair degree of roll, the understeer factor remains constant whether the keel is even or heeled. This, in short, isn't a car that makes you reach for the bannisters in panic in the middle of your manoeuvers.

During our test, the front tires were inflated to 30 psi, a drastic six pounds above recommended pressure, but in spite of this the steering remained heavy at slow speeds and on extremes of lock. In efforts to kill the understeer we tried running the rear tires 4 pounds softer than the fronts, but this didn't avail either.

Visibility is good all around by the admittedly sub-American standards prevailing in Europe, with the one exception that the windshield pillars bisect an often used sighting line. With the rear seats unoccupied—or occupied by people with undersized knees—the front seat can be adjusted to a position allowing a perfect arm reach for an average driver. Back there, moreover, he can still get his feet on the pedals without a stretch.

The Minx brakes, with 29 square inches less lining area than the Rapier's, and lacking the Rapier's ribbed front drums,

continued on next page

TOURING AIDS

LIGHTWEIGHT LEAK-PROOF GAS CAN

A thin 5-liter emergency gas can which will fit in a small space has pressure-sealing neoprene gasket in cap. Handle lifts to form handy pouring spout..... $8.50

KAFFEEMASCHINE FOR INSTANT COFFEE TEA COCOA

Attaches to any dash, heats water quickly, whistles when hot.
6 Volt 1-cup..... $12.95
12 Volt 1-cup..... $12.95
12 Volt 4-cup..... $14.95

VDO INSTRUMENT PANEL

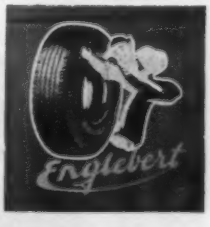
Fits into dash grille of VW, gives constant reading of generator output, oil temperature and fuel level . . . a real help on long trips. VDO are original equipment suppliers. for VW, same high quality. PANEL UNIT $38.20
Ammeter only..... $4.35
Fuel gage..... $13.95
Oil Temp gage..... $17.95
Panel only..... $1.95

Competition
ACCESSORIES

11704 E. Ventura Blvd.
Studio City 9, California

Your Headquarters for Porsche and Volkswagen accessories.

U.S. Distributors for
Englebert
The world's finest tyre Competition 'P' — Racing Stabimax —Sport Volumax — Touring



Western Distributors for
Oilzum
Motor Oils
Non-Detergent
H-D
Diesel gradients
S-1, S-2, S-3
"Choice of Champions"

VOLKSWAGEN OWNER'S HANDBOOK

NEW!

144 pages
over 150 illustrations

Here is a brand new book every VW owner and prospective owner will want. Written by Clymer Publications' Technical Editor, Hank Elfrink, who has recently visited Europe and atterded the VW mechanics school, this book gives full details on care and servicing of the VW, in nontechnical language. A MUST for the VW owner and enthusiast. Postpaid.....$2.00

AROUND THE WORLD
with Motorcycle and Camera

This thrill-packed travel book by German journalists and expert photographers, Eitel and Rolf Lange, has many photos and maps of their recent around-the-world journey by motorcycle and sidecar. Educational, humorous and fascinating story of their experiences in every country. 94 photos of famous people and places. Gives details of costs, regulations, problems and all information the world traveler will want to know. 230 pages.
NEW, JUST OUT. Postpaid.....$2.50
DeLuxe (Fabrikoid bound with gold leaf lettering). Postpaid.....$4.00

OTHER BOOKS

1956 INDIANAPOLIS YEARBOOK	$1.50
FORD OWNER'S HANDBOOK	$2.00
CHEVROLET OWNER'S HANDBOOK	$2.00
PLYMOUTH OWNER'S HANDBOOK	$2.00
THE SPORTS CAR ENGINE	$1.50
THE MODERN CHASSIS	$2.00
MODEL T FORD SCRAPBOOK	$2.00

Catalog on 100 books—FREE!

Floyd Clymer, 1268 S. Alvarado, Dept. SC-9 Los Angeles 6, Calif.

ROAD AMERICA

Greatest four mile challenge on the North American continent.

presents

ROAD AMERICA 500

SCCA Sports Car Classic

Sunday, September 8

Two 2 Hour Races

Saturday, September 7

Elkhart Lake **Wisconsin**

KEY LABELS

An important Accessory of Distinction with an Important Function . . . Real Morocco Leather — Original Factory Design Medallions in Jewellers' enamel and chrome . . . Available: Alfa, AH, Jag, MG, M-Benz, Porsche, Renault, RR, Simca, TR, VW and many others.

$1.50 EA.

(Calif. add 4% Tax)
dealers' inquiries invited

PEDAL PADS

Austin Healey, Jaguar (long type), MG-TC and MG-TD/TF Original English Replacement Pedal Pads

$1.00 PR.

(Calif. add 4% Tax)

Offices & Showroom
10305 Santa Monica Blvd.
West Los Angeles 25, Cal.
CRestview 1-3775

Vilém B. Haan
FOREIGN CAR ACCESSORIES

MAILING ADDRESS
P. O. BOX 54
BEVERLY HILLS
CALIFORNIA

Minx

continued from preceding page

nevertheless give quite a good account of themselves under punishment that they were never designed to take. On cars of all makes and types that are actually delivered to them for conversions, Alexander can and sometimes does fit harder brake linings on request, but the Minx we tried had not been so treated.

As this is written, parleys are in progress which Christie hopes will result in arrangements whereby American purchasers of new Hillmans will be able to specify the full Alexander prescription when placing orders with their domestic dealers. The procedure, if these negotiations are satisfactorily concluded, will be for the car to be shipped from the parent plant to Haddenham, then converted, finally reshipped over the ocean, complete with hop-up, overdrive, floor shift and the stylistic gooks passingly mentioned at the start of this report. These comprise a tapering stripe down each body flank, in a color harmonising with the stock decor variants, as seen in photos here appearing; chrome plated turbo disks for the wheels, rather in the Rapier manner; and, for buyers who desire it, a polished wood dash and interior trim (What won't be included is the legend ALEXANDER CONVERSION CAR that our test Minx had emblazoned in red letters across the back window. After having to explain to an old lady that we weren't traveling evangelists, we masked the ambiguous words out).

Whether or not this deal pans out, Alexander is already geared for the direct supply of the three conversion elements—in combination or otherwise—to individual U.S. customers. Exact prices naturally depend on final destinations but these are approximations for East Coast regions:—

1. Engine pack plus overdrive plus central shift, $370.0, including freight. 2. Engine pack only, $140.0. 3. Shift only, $35.0. Prices for items 2 and 3 do not include freight, which hasn't yet been arrived at.

Another set of negotiations altogether, which won't be prejudiced one way or the other by the proposed Alexander-Rootes tieup, was on the hob when our report was written. If this one comes off, the Arnolt Corp., of Warsaw, Ind., will come into the picture as middlemen between Alexander in England and interested Americans who already own Minxes, making the latter independent of direct communication with Haddenham. Buyers within driving distance of Warsaw will have Arnolt's fitting facilities at their disposal. Kits shipped from England to users will have full fitting instructions enclosed.

And how, in this eternal game of leapfrog, does a Rootes client go one better than somebody who has already gone better than the Joneses with their stock Hillmans or Sunbeams? Well, Christie has the answer—he buys Alexander's latest big valve head, designed specifically for the Sunbeam and, with its 74 bhp potential, warranted to make a Rapier go faster than the warmed up Minx that merely goes faster than the stock Rapier.

—Martin Denis

Horses

(Continued from page 47)

couple of points in the engine's range.

Based on the Norton cycle cylinder head, the Vanwall's engine has four pipes of equal length leading to one balance box, from which a single pipe leads to the rear. Similarly, one of Ferrari's first changes to the V-8 Lancia was the installation of four straight pipes for each bank, fitted with megaphones in some cars. Ferrari, like HWM and Alta, had tried very short stub exhausts, but the longer versions have a similar effect over a wider range. Also experimenting, almost frantically, is Gordini, whose eight-straight-pipe rig on his latest G.P. car resembles a mobile pipe organ. Results are not conclusive.

A much more marked trend for four cylinder (and some eight cylinder) engines is the blending of the right pipes at the right places to give a true scavenging system, in which each cylinder helps out the others as much as possible. Tests by everyone from MG to Mercedes show that such a rig can give a usable power increase over the whole rev range. A typical scavenge setup for a four-barrel joins cylinders 1 and 4 into one Y junction, and likewise with cylinders 2 and 3. Two pipes from these Y's then join again at a third Y, or in a balance box. A single pipe leads from there back.

The complex manifolding on the BRM is of this type, as is the very clean Connaught system, which was one of the pioneers in '52. In multiple form it's been adapted to other versions of the Gordini eight and to the Mercedes racing engines, while it's finally showing up in that remote outpost — Indianapolis.

Six cylinder engines seem to be more easily satisfied. Maserati has made them happy with both a single-pipe collector and separate manifolds for the front and rear cylinder trios. The latter arrangement has long been used by Gordini and by Bristol engine fanciers, and the Maser mechanics have been heard to say that it gives them better power low down. They often revert to a big single pipe for high-speed running. There's no definite answer here yet, nor is there in any segment of engine design, but as long as racing goes on there'll be no lack of possible solutions.

MECHANICAL EFFICIENCY

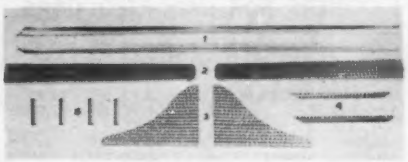
Returning once again to Ricardo's remarkable Vauxhall, we find that its good output was due just as much to exceptionally high mechanical efficiency as to advanced combustion chamber layout. At 1500 rpm it translated 93 per cent of its combustion pressure into force at the flywheel, and at peak power (4500 rpm) it still delivered 78 per cent. It's no use refining the top end unless a sensible amount of its output can be converted into mechanical power, without excessive loads from bearings and other sliding surfaces. Ricardo attacked the problem from three main angles: piston friction, fluid pump-

continued on next page

NEW BELL
500 TX*
The **FIRST** Full Face
Competition Racing Helmet To Use
the NEW! ENERGY ABSORBING
NON RESILIENT LINER
As Specified By The
SNELL FUND STUDY

This Study Conducted By Geo. G. Snively M.D. is the first Comprehensive Racing Crash Helmet Test ever made in this Country.
(See Preliminary Article SPORTS CARS ILLUSTRATED)
JULY, 1957
HELMET WITH VISOR **$38.50**
HELMET LESS VISOR **$36.50**
* LICENSED BY TOPTEX
BELL AUTO PARTS
3633 GAGE AVE.
BELL, CALIF.

RALLY EQUIPMENT
A new accurate, legible 6" circular binary-type computer for Sports-Car Rallyes, $7.50, in handsome glove-leather case, $8.50.
Stop Watch Holders: One piece black anodized aluminum, $2.50. California add sales tax.
Write us today.
STEVENS ENGINEERING CO. (Dept. S)
2421 Military Ave., W. Los Angeles 64, Calif.



MGA OWNERS
Fine Handmade LE MANS styled Accessories
I. Aluminum cover strip to hide unsightly finish along outside bottom of car. $7 a pair.
II. Threshold covers of engine turned stainless steel. $12 a pair.
III. Stainless steel engine turned scuff plates for inside of doors. $12 a pair.
IV. Clips of engine turned stainless steel for top edge of door compartment. $5 a pair.
V. Stainless steel engine turned spoke covers for steering wheel. $5 a set.
All 5 Items Shipped Postage Free $30
In Calif. add 4% sales tax — No C.O.D. please.
Many fine handmade items for Jag, MG, VW, etc.
Write to ERNIE HANELINE, Box 141
SUNSET BEACH, CALIF.

Specialists in Service for
Jaguar - MG & Austin-Healey
Now Specializing in
LANCIA
OSSIE & REG
2800 So. Crenshaw, Los Angeles
RE. 2-0470

RARE
SPORTS CAR ACCESSORIES

Sportall Coveralls: Just what you want for Race or Rally. All sizes, all colors. 20.95

Special Corvette Tonneau Cover: Outstanding custom tailoring. 3 year guarantee. only 34.50

RARE Leather and Vinyl Cleaner: Works like magic. Simply spray on and wipe the dirt away. Large plastic spray bottle..... 1.25

RARE Spare Bulb Kit: Stores one seal beam, all stop, tail, brake, parking and dash light bulbs and fuses in handy circular metal cabinet. only 3.95

Helmets:
English —Cromwell
German —Rooner
American—Gentex
All Sizes

Tire Gauges:
Imported German competition gauge.. 4.50
Rally Type tire gauge..... 3.50
Guaranteed completely accurate.

Car Shampoo: A special RARE liquid cleaner for your fine sports car finishes. Very gentle but super effective. 1.25

RARE Chronometer: Be a winner every time with the exclusive in and out check point feature of this fine chronometer. Records for 12 hours — *guaranteed.* 39.95

Race and Rallye Equipment
SPORTS CAR ACCESSORIES AND FURNISHINGS EXCLUSIVELY
8 East Main Street • Dundee, Illinois

Fiberglas
SPORT BODIES
$295
AND $495

Years Ahead Styling . . . Today!
New Fiberglass "Speedster" or "Sabre" Sports Bodies easily "Bolt-On" any chassis. LIGHTER, stronger-than-steel body gives "sports car performance." Fun! Fast! Sporty! $295 "Sabre" fits Crosley, Fiat or any 72-88" W.B.) ($495. "Speedster" fits Ford, Chev., Willys, Henry J. & all 90-106" W.B.) (Also available for longer cars) FREE! "Car-A-Log" with photos & plans. EASY "STEP-BY-STEP" CONVERSION TIPS. . . . PICTURES OF WHAT OTHERS HAVE DONE. . . . 25c for handling & post. (FREE gift worth 50c included.)

Free!

ALMQUIST Eng. Co.
DEPT. SCIS9 • MILFORD, PA.

Edith's
POST OFFICE BOX 1221 — Terry Covers — BAKERSFIELD CALIFORNIA

COOL WASHABLE SEAT COVERS FOR IMPORTED CARS

	Terrycloth	Corduroy
VW front seats (2)	$ 9.95	$12.95
VW rear seat	9.95	12.95
Porsche Cpe. & Conv.	11.95	14.95
Karmann Ghia	11.95	14.95
MGA & TF	9.95	12.95
MG-TD, TR's & Healey	9.95	
Jaguar XK-140-120	11.95	
Mercedes 190SL	10.95	

Specify color: Solid colors in Terry; Silver, Beige, Charcoal, Red, Gold. In Corduroy; Silver, Charcoal, Red, Tan, Blue. Stripes in Cord; Red & White, Tan & White.

Give make, model & year of car

Postpaid if remittance accompanies order.
California residents add 4% tax.

RAMCOTE
FLEXIBLE FINISHES
Restores — Colors
Protects Leather, Leatherette and Vinyl Plastic

Is your leather or plastic upholstery faded or worn? RamCote restores the original color and texture to your car's upholstery. You can change color, too! Available in eleven standard colors and clear. Any shade obtainable by inter-mixing colors. Easily applied, brush or spray.

Won't chip or peel. Waterproof — fadeproof. Use on Luggage, Sports Equipment, Lounge Chairs, etc. See your local dealer or write for FREE information and color chart.

RAMCOTE PRODUCTS
1141 W. 69th St.
Chicago 21, Ill. Dept. SC 9,

Frank Millard Sport Cars
15531 Ventura Blvd.
Encino, California — Phone State 9-6176

MERCEDES BENZ — MORRIS
BORGWARD — JAGUAR
MG — ALFA ROMEO
AUSTIN — AC ACE

"Where the stars buy their cars."

Horses

continued from preceding page

ing losses, and bearing and auxiliary friction.

Some designers maintain that piston friction can usefully be reduced by compact, slipper-type pistons. Ricardo adhered to this, as do Vanwall and the creators of the Factory D-Jag engine. While popular in England, the slipper-type has few supporters abroad, such firms as Lancia, Mercedes, Maserati and Porsche preferring full-skirt pistons, sometimes with oil scrapers below the wrist pin.

Also important is the viscosity of the oil on the cylinder walls, and extensive oil cooling is often employed to allow the use of low-viscosity lubricant throughout the engine. Even with heavy oils, though, piston ring drag can be minimized by keeping the cylinder walls evenly warm. This is done by restricting or eliminating direct water circulation to the block, causing the water there to be semi-stagnant and to circulate by convection only. Cool water from the pump in such a case is ducted direct to the exhaust valve guides and seats, and then across to exits on the intake side of the head. There may be a small additional supply to the block and main bearings. This is almost exactly the system followed by Maserati, who pump cool water direct to a manifold in the head.

A generally high running temperature, allowed by pressure systems and special coolants, will reduce running friction throughout the engine and also reduce combustion heat losses to the chamber and cylinder walls. The latter, though, is not significant. However, since a high operating temperature presents a higher temperature differential at the heat exchanging surfaces of the radiator, this important component can be reduced in area and bulk. This means less weight and less aerodynamic drag. You can't take advantage of this unless your engine is exceptionally free from potential hot spots to begin with. The Vanwall exemplifies this approach, having ducting, radiator area and running temperature figured to very tight margins. (Ed note: so tight that at Monaco this year they appeared with a shorter nose around a larger air intake and radiator).

"Fluid pumping losses," in Ricardo's sense, refers to gas friction and restriction in the top end passageways. If volumetric efficiency is high and gas velocities low, this takes care of itself.

In 1922, reduction of bearing friction at once meant anti-friction bearings, since plain metal shells hadn't progressed far beyond the white metal phase. The Vauxhall, then, had ball bearing mains and roller big ends, on a built-up crankshaft. This was standard wear for most GP engines through the Thirties, but after the last war great steps were made in the development of replaceable heavy-duty bearing shells. Colombo, with his new Ferrari designs, led the breakthrough to wide-

continued on next page

Classified

RATE: 25¢ per word. Minimum 10 words. December issue closes September 13th. Send orders and remittance to: SPORTS CARS ILLUSTRATED, 366 Madison Avenue, N. Y. C. 17.

FOR SALE

BUILD Your Own Supercharger — Complete plans and instructions, $1.00. Alanne Products, Box 135, Watertown 2, Conn.

JAGUAR owners, Healey owners: Stainless Steel Flexible Exhaust Tubing Permanent replacement between exhaust pipe and muffler. Complete with heavy-duty clamps. Healey $5.50, Jaguar $5.95 (modified requires two) postpaid. Quantity inquiries invited from dealers. Wilco, P.O. Box 1128-S, Rochester 3, N. Y.

MAGNIFICENT full color prints. World Famous Sports Cars, 6 large 12 x 14" suitable for framing, value over $12, only $1.50 postpaid. Borden Publishing Company, 3077 Wabash Ave., Los Angeles 63, California.

LE MANS—A beautifully lithographed projection of the Sarthe Circuit on 14x22 parchment. Designed for framing and ideal for den or club. $2 postpaid. Le Mans Box 115, North Andover, Massachusetts.

FOR Sale—Mondial Ferrari in top condition. Full price $5650.00. Classified Box #103, c/o SPORTS CARS ILLUSTRATED, 366 Madison Avenue, New York 17, N. Y.

4.5 FERRARI Coupe almost new. Genuine leather upholstery. Farina Body. 310 H.P. Sales Price $8600.00 Classified Box #104, c/o SPORTS CARS ILLUSTRATED, 366 Madison Avenue, New York 17, N. Y.

4.9 FERRARI—New light chassis. 95 inch wheel base. Streamlined body. 380 H.P. $12,000.00. Classified Box #105, c/o SPORTS CARS ILLUSTRATED, 366 Madison Avenue, New York 17, N Y.

FOUR Speed Corvette gear boxes. Will replace powerglide or 3-speed transmission. Suitable for other installations. Write for full details. Devin Enterprises, 44500 Sierra Hwy., Lancaster, California. Phone: WHitehall 2-4719.

SAFETY Belts—B-11 Government Surplus 3" wide webbing, Quick Release Buckle, $5.00 each, Post Paid, Send Cash or Check to Greiff, 506 Broadway, NYC.

LUGGAGE Racks For All Small Cars Portable Break down Type. Plastic Fuel And Oil Lines, Leather Paints—Nuagane, Free List. Schreiber Imports, Box 4125, Long Beach 4, Calif.

THE Sporting Motorist's Agency offers: Alfa Romeo 2.9, one of the fabulous 125 m.p.h., tandem supercharged, straight eight, Touring bodied coupes. Low mileage, requires detailed work, $650.00 f.o.b. Ann Arbor. Alfa Romeo Gran Sport Zagato 1750 s.c. two seater, newly and meticulously restored to the last cotter key, mint. $2600 f.o.b. Amsterdam. Mercedes-Benz 500K D.H. Coupe, 4 seater, restored as above and Mint. $2350 f.o.b. Amsterdam. Also, complete 540K engine. Write for list of other fine cars. Box 333, Ann Arbor, Michigan.

RADIOS For Your Car — Kits available for Volkswagen, MG Jaguar etc, Most makes of Domestic and Foreign cars, Boats etc. Service on all makes. Radio kits Antenna Included 39.95 up. Write for information. MacDonald Radio & TV Co., 315 Hudson Street, Syracuse 7, N.Y.

AUSTIN Healy owners! Imported, International Driving Plate. Black letters "GB" on white background on 9" aluminum plate. $2 each. Money back guarantee. Continental Tags, 22 Chester Drive, Yonkers, N.Y.

RENAULT Owners! Imported International Driving Plate. Black letter "F" on white background on 6" oval aluminum plate. $2 each. Money back guarantee. Continental Tags, 22 Chester Drive, Yonkers, N.Y.

AUTOMOTIVE EQUIPMENT

THE Truth about Speed-Power-Mileage Equipment. Free Catalog. Write! Almquist Engineering. Milford SC2, Pennsylvania.

PHENOMENAL Gasoline Mileage. Easy home modifications. Supplies—parts available everywhere. Complete working instructions $1.00. Charles Lewis Hall, Sepulveda, California.

SPORTS CAR BODIES

FIBERGLAS Sports Bodies — Easily bolts on Crosley, Fiat, etc. — $295. Jaguar, Ford, Chev, etc. — $495. Free Brochure. Almquist Engineering, Milford SC4, Pennsylvania.

MISCELLANEOUS

$200. MONTHLY Possible, Sewing Babywear! No house selling! Send stamped, addressed envelope. Babygay, Warsaw 76, Indiana.

BINOCULARS repaired, all makes and models. Authorized Bausch & Lomb, Zeiss, Hensoldt, and Bushnell dealer. Tele-Optics, 5514 Lawrence, Chicago 30, Illinois.

NOW Dismantling — All types foreign cars Jaguar, Porsche, VW, MGTD, MGTC, MGTF, Alvis, Anglia, Austin, Healey, Consul, Hillman, Jowett, Morris, Renault, Rover, Singer, Sunbeam, TR-2. All inquiries welcomed. We deliver anywhere. Sherman Way Auto Wreckers, 12643 Sherman Way, No. Hollywood, Calif. Po-50360, St-75479.

EUROPEAN Antique And Classic Cars. Old car enthusiast, travelling regularly between New York and London, willing to find, and buy for you, the car you want. Can also obtain spare parts. Sturgeon, P.O. Box 1295, Grand Central Station, New York 17, N. Y.

OBSOLETE bearings rebuilt, reheat-treated, reground, fitted oversize balls—consult The Sporting Motorist's Agency, Box 333, Ann Arbor, Mich.

EARN High Pay: Jobs in South America, the Islands, USA, Europe, Canada, other foreign countries. All Trades, Mechanics, Truck Drivers, Laborers, Office Workers, Engineers, etc. Chance to travel. Fare paid if hired. Application forms. Free information. Write Dept. 126, National Employment Information, 1020 Broad, Newark, New Jersey.

750 CC Shoestring Special. Why spectate? Participate! You can build this class H winner at home using Crosley components. 100 mph, OHC, disc brakes! Get into competition for as little as $200. Send $2 for instructions. Sportscar, Box 711G, Columbus 7, Ohio.

who

is the most photogenic girl in the world?

ED SULLIVAN, famed CBS showman, picked her from more than a thousand photographs submitted by cameramen throughout the globe!

PETER GOWLAND, renowned glamour photographer, photographed her on the world's fastest color film—the new Super Anscochrome!

AND POPULAR PHOTOGRAPHY will include an actual color slide (ready to flash on your wall) of THE MOST PHOTOGENIC GIRL IN THE WORLD in its big September issue on 35mm photography.

It's typical of the extra features you'll enjoy in September POPULAR PHOTOGRAPHY's Special 35mm issue.

Look for it at your favorite newsstand.

On sale August 1—only 35¢

Everything for Sports Cars!

Accessories—Equipment—Parts
including hard-to-get items
Chargicator - Tachimedion, etc.
Write for Price List
Dealer inquiries invited
IMPERIAL MOTOR PRODUCTS, Ltd.
414 Northern Blvd., Great Neck, N. Y.

750 cc 1100 cc

STANGUELLINI

CLASS WINNER SEBRING 1957

HERMAN BEHM & CO.

U.S. DISTRIBUTORS

529—20th ST. OSHKOSH, WISCONSIN

Horses

continued from preceding page

spread use of Vandervell "Thinwall" bearings, which in extensive tests had equalled and exceeded the mechanical efficiency of rollers. Also, of course, they were cheaper and far easier to maintain.

These shells are now tri-metallic, and have a steel backing and a thin plate of lead-indium or lead-tin as a working surface. The intermediate metal is a copper-lead alloy to prevent scoring of the journals in the event of lubrication failure.

The Mercedes M196 engine was a throwback in that its designers relied totally on their great accumulation of data on roller bearings. It was the safest approach for them, and seemed to have paid off when Fangio finished at Barcelona in 1954 with nothing but rollers in the sump. The one engine that makes consistent use of anti-friction bearings today is the Porsche Type 550, which combines this with clean shaft drives to the cams, to give better-than-average mechanical efficiency.

SUMMING UP

The new GP formula of 1954 was drafted by men who were tired of the complexity and cost of blown engines, and who wanted to bring racing into the range of unsupercharged production powerplants. As ever, this was something of a delusion, but the formula has led to complete revision of many commonly-held beliefs in racing engine design. Notably, the pure hemispherical combustion chamber has proved inadequate to current demands.

As engine speeds rise, and the struggle continues to get more than 100 per cent volumetric efficiency through certain ranges, it's no longer enough to combine some of the techniques mentioned above. They must all be planned and developed together, as some, improperly used, can make brutal gouges in the power curve. Several ideas can be adapted to existing engines, but the best have been designed in from the ground up.

Advances in metallurgy are also helpful to the racing designer, but they filter down slowly from suppliers. Also, it's very tough to make consistently good alloys in the small quantities required by racing work. Most layout men make allowance for possible faults, but in competition with the formula the margin is exceedingly small, and there are those who will try to press beyond it. Ricardo expressed the dangers well: "It is far better to use 500 parts if need be, to comply with the laws of sound mechanics, than to defy them with a single part."

We may see two horses for each cubic inch of an unblown engine in 1957. If so, it'll be the result of mastery of long-understood basics, in just the right combination. As we've also seen, peak output isn't the only goal for road racing; middle range power and responsiveness are just as useful and just as elusive. The turbine may be the internal combustion engine of tomorrow, but there's still a lot of fun to be had with poppets and pistons.

Karl Ludvigsen

What's our Line...

SERVICE?

...Yes Indeed!

THOROUGHBRED provides the finest imported car service in the southwest! And . . . the most reasonable.
How come? Easy . . . the large volume we enjoy in Service AND Sales enables us to offer the best of facilities to our customers. Try us . . . you'll see!

***SERVICE*—guaranteed repairs**
***SERVICE*—best trades**
***SERVICE*—THE best cars**
. . . and another REAL SERVICE
BANK FINANCING

PLEASE ALLOW US TO BE OF SERVICE TO YOU SOON AT OUR NEW LOCATION
820 N. Broadway • Oklahoma City

Thoroughbred CAR COMPANY

DEALER FOR—JAGUAR, MG, MORRIS, ROLLS ROYCE, AUSTIN-HEALEY, MERCEDES-BENZ. ALFA-ROMEO, PORSCHE, and DKW.

THE NEW HOME OF
ISKENDERIAN RACING CAMS

The Only American Manufacturer
WITH FACILITIES FOR THE DESIGN AND PRODUCTION OF

RACING CAMS for both FOREIGN and AMERICAN SPORTS CARS

CAMS and ENGINEERED KITS
In Stock for the Following:

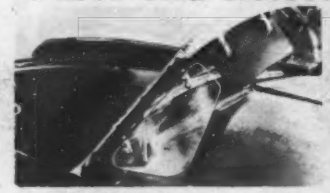
- JAGUAR
- AUSTIN-HEALEY
- VOLKSWAGEN
- PORSCHE
- TR-2, TR-3
- MGA, MG
- VOLVO

We also grind cams for other foreign cars. Write for specific information on your car.

ISKENDERIAN RACING CAMS

ED ISKENDERIAN
607 No. Inglewood Ave.
Dept. SCI, Inglewood, California

Kunyan — The Country's Largest Supplier of—
Division of Brigham-St. John, Inc.
FOREIGN & SPORTS CAR Parts and Accessories

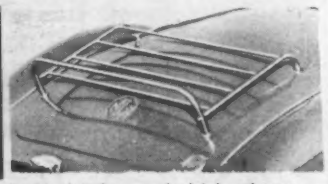


WIND WINGS and SUN VISORS

Thick plastic wings will not interfere with side curtains or top. May be attached without drilling holes. Fittings are solid brass, machined.
Austin-Healey, Jaguar, Mercedes-Benz, Nash Metropolitan ..... $19.95 pr.
MG, Triumph TR2, TR3 ..... 16.95 pr.

Visors are made of polarized plastic. Machined, solid brass fittings; triple chrome plated. No holes to drill.
MG, Triumph TR2, TR3, Each..... 6.95

LUG-GAGE RACKS



Made of sturdy, tubular steel, triple chrome plated for weather-proof wear. Cleverly designed fittings simplify installation.
MGA, Austin-Healey, Jaguar, Triumph TR2, TR3, Thunderbird.....$39.95

GRILLE GUARD FOR "MGA"

Curved solid steel bar is machined flat to fit spring steel support bracket. Brackets are sturdy, one piece construction. Fits onto existing bolt in frame. Simple to install, no holes to drill. Complete with instructions. Triple chrome plated for weather-proof wear....$29.95

DeLUXE SPORTS CAR KEY CHAINS

Reflects pride of ownership. Keys and chains are 18 karat gold plated with lustrous baked enamel sigs. For MG, Jaguar, Volkswagen. Specify number on your ignition key when ordering.
Key Chains $1.00
Key and Chains..... 1.50

DRIVING GLOVES Men–Women

Luxurious, high quality kid. Made in Germany. Ribbed palm, perforated back. Choice of tan or black. Half sizes for women from 6 to 9 . . for men from 8 to 12.
$5.95 pair

Racing Gear, RALLY, LUCAS, Etc.

Send for big, illustrated 96 page catalog. Complete listing on parts and equip. Only $1.00 (Refundable in full with first purchase)

Kunyan — Dept. S-8, 7715 Melrose Ave., Los Angeles 46, Calif.
Division of BRIGHAM - ST. JOHN, Inc.

Indy

(Continued from page 58)

midnight oil. The final touch may have come when Bettenhausen's engine backfired into the manifold to crack open the popoff valve. The blower wasn't damaged, but examination revealed a collapsed piston, plus a scored cylinder wall.

Two members of the "we're-just-here-for-the-fun-of-it" club were included in the entry list. One saw some action. The other at least got a look at the Speedway from the inside. A slightly oversize 93-cubic inch two-stage blown Maserati Grand Prix job showed up in tow behind a gentleman from New Jersey named Bob Morgan. Morgan had himself a ball, because his garage became a stopover point for all the regular hot dogs who wanted to eyeball his little Italian jewel. He gave Keller and Danny Kladis a ride in it, and the latter posted a qualifying time of better than 124 mph., to be a member of the starting field until bumped.

An Indianapolis policeman, Eddie Shreve, unearthed the old Don Lee-Joel Thorne Mercedes-Benz chassis and put a modified D-Jaguar engine between the rails to see what would happen. With higher compression, radical cam, and magneto ignition the Jaguar engine undoubtedly could boast of more power. However, the car never got in a full lap. Their last efforts came when the crew had the front wire wheels replaced the wrong way, and couldn't tighten the wing nut without having the spokes rub the brake drums. The technical committee would not let them out on the track after that one, saying they were a hazard on the course.

What the future holds in the way of new engineering is problematical. There is nothing on the immediate horizon which would indicate the Meyer-Drake is going to be relegated to the scrap heap. With the particular demands of this oval concerning torque application, the rise into prominence of an unblown V8 is dubious. The razor sharp boys among the wrench twisters' fraternity say a six might supercede the four. But, where is the money to develop it? They claim a two stage Roots blown V8 should run away from the corners and hide, but then again you need that thing called money — times three.

Chassis-wise, the outlook may be a different story. The horizontal engine trend is certain to be explored further, plus the fact Kurtis is beginning to doodle around on different forms of independent suspension. The components manufactured by Ted Halibrand, such as steering gears, magnesium wheels, spot brakes and the like, probably will remain in somewhat of a standardized form. Although Halibrand's operations are fluid enough to fit any variations in design.

It will be May, 1958, before this place is open for business again. By that time, a brand new cast of characters will be on the stage. And who knows? Maybe one of them will take the wraps off a box which will make the 21st century seem here today.

George Moore

Carrera

(Continued from page 23)

One of the best features on this new Carrera is the front brakes, for they have been taken directly from the RS Spyder and fitted to this faster version of the production Carrera. Last year, the car had a braking area of 122 sq. in. while this year's GT model sports 148 sq. in. Thus, the results of the SCI brake test came as no surprise, when no fade was indicated at the end of the ten 60-0 stops. The brakes were smooth, demanded no abnormal pressure, and had perfect balance. Braking is one department that Porsche has always been good on, ever since they introduced bimetallic drums in 1952. The capabilities of these new Carrera GT's is demonstrated by the results of the 1957 1000 Kilometer Race on the "Nürburgring in Germany, for the class-winning Carrera GT of *Herren* Straehle and Denk averaged 75.5 mph while Riess and Schock in the best 300SL turned an average of 77.4. Not much difference in these two times, both by top drivers: so make no mistake about it, the Carrera Gran Turismo is a fast car not to be sneezed at in competition.

The ride is typically post-1955 Porsche —softer than expected for a sports car but far from uncomfortably so, for in the bucket seats one has excellent lateral as well as vertical support. The easily read instruments are well illuminated at night with a rheostat control and it was pleasant to note that Porsche has replaced the earlier high-beam warning light that had such a terribly harsh glare with a very subdued blue lamp.

Glove compartment and door pockets of the normal Porsches have been sacrificed for lightness; the only places for car papers and maps are pockets on each side of the cowl near the floor. With the top erected, there is a surprising amount of room behind the seats; up front, with the new, enlarged gas tank, there's just about enough room for a spare set of spark plugs and a few tools. The windshield washer, in its plastic bag, fits snugly between the side of the tank and the interior wall. The fuel tank has an extraordinarily large reserve, as our test car switched on to reserve at ¼ full. This means you've got about 5 gallons left when she begins to sputter.

The engine compartment is so crowded that the oil tank for the dry sump system sits in the fender just behind the left rear tire. Carreras run a great deal cooler than normal Porsches. During the Mille Miglia, for instance, one of the faster car's oil gauge never exceeded 176 degrees F.

This competition Carrera Speedster has been one of the most exciting cars we ever had the privilege of testing. As always, Porsche is moving forward in design trends. It's intriguing to consider what will come next from Ferry Porsche's team of engineers. Whatever it is, it will certainly represent the advanced thinking in automotive design.

Jesse Alexander

PRINTED IN U.S.A.

Pit Stop at Sebring

The new MGA Sports Coupe

a class of its own . . .

Your first mile behind the wheel of an MGA will show you why these rugged little speedsters won the Sebring 12 Hour Grand Prix Team Trophy and placed first and second in class. And one quick look tells you the MGA is tops in smartness too. The sleek, low lines of both the Sports Roadster and its new "twin", the all-weather Sports Coupe, are a mark of distinction everywhere you go.

Ask your dealer to tell you about the 12 months' warranty on parts and the surprisingly modest cost of an MGA.

Safety MG *fast*

Represented in the United States by

hambro AUTOMOTIVE CORPORATION • 27 West 57th Street, New York 19, New York

A product of The British Motor Corporation, Ltd. • Sold and serviced by a nationwide network of distributors and dealers.

JAGUAR

THE NEW THREE-POINT-FOUR 5 PASSENGER SEDAN

JAGUAR

The Three-Point-Four sedan is the most versatile Jaguar ever built. It brings together without compromise the sureness of response and the precise handling of the true sports car with the comforts and conveniences of a four-door family sedan. It is powered by the latest version of the famous "XK" engine developing 210 horsepower and is capable of safe speeds in excess of 120 M.P.H. Automatic transmission featuring a finger-tip control by which intermediate gear may be held indefinitely is standard equipment. Four-speed manual shift is also available. Now on display at your Jaguar Dealer's or write Jaguar Cars North American Corporation, 32 East 57th Street, New York 22, New York.